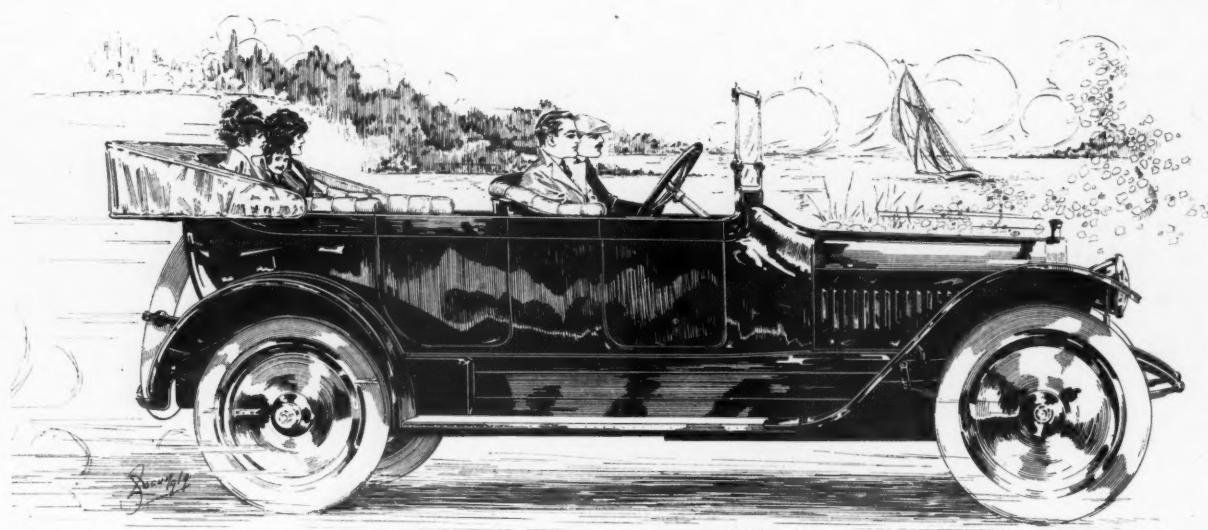


# MOTOR AGE



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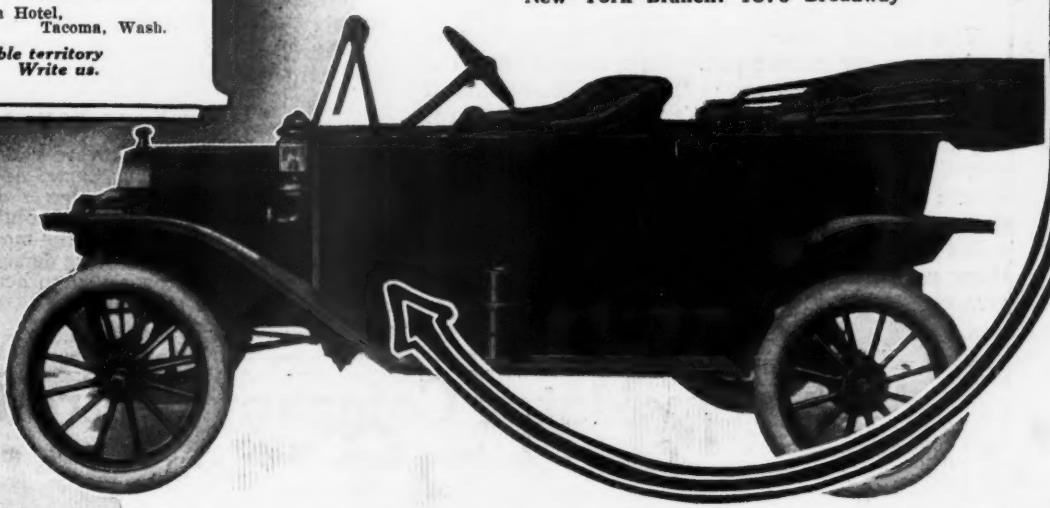
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Volume XXVI

August 13, 1914

No. 7

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## Contents

LINKING FIVE OLD TRAILS TO MAKE A MODERN MOTOR HIGHWAY	5
History of an ancient transcontinental route	
EUROPEAN WAR AFFECTS PRICE OF RUBBER	11
Some American makers advance list on tires	
EDITORIAL—TIRE CONSERVATION THE WATCHWORD	12
TWENTY-FOUR CARS NAMED FOR ELGIN	13
Classy field to run in Kane county classics	
EUROPEAN WAR AS IT PERTAINS TO INDUSTRY	14
Motor Age correspondents report situation on other side of the Atlantic	
ILLUSTRATION—FRENCH PRESIDENT INSPECTS RUSSIAN ARMY— MOTORIZATION OF THE FRENCH ARMY	16
WAR GIVES U. S. CHANCE IN SOUTH AMERICA	18
Export possibilities of motor industry reviewed	
UTILIZING THE HILL SIDES FOR PRIVATE GARAGES	20
Some examples of California architecture	
MOTOR CAR STIMULATES HIKING	22
Walkers at Santa Barbara use it to get to mountains	
MOTOR CAR DEVELOPMENT	24
Descriptions of Overland, Grant, Franklin, KisselKar and Moon	
INDEX TO ADVERTISEMENTS	98

**DEPARTMENTS**

Routes and Touring Information	23	Coming Motor Events	40
Cyclecar Development	35	Recent Incorporations	41
Readers' Clearing House	36	Among the Makers and Dealers	42
The Accessory Corner	38	Brief Business Announcements	43
From the Four Winds	40	Motor Car Repair Shop	44

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# MOTOR AGE

## Linking Five Old Trails to Make a Modern Motor Highway

*OH, did he not know the old, old road! The boy gripped his rifle unconsciously as though there might yet be a savage lying in ambush in some covert of rhododendron close by. And, as they trudged along, for it was growing late, the schoolmaster told him, as often before, the story of that road and the pioneers who had trod it—the hunters, adventurers, emigrants, fine ladies and fine gentlemen who had stained it with their blood—and how that road had broadened into a mighty way for a great civilization from sea to sea.—The Shepherd of Kingdom Come.—John Fox, Jr.*



By  
J. C. Burton

**S**TRETCHING 3,800 miles across the American continent and joining the capital city, Washington, with the exposition city, San Francisco, are five old historic trails that have been linked together to make a modern motor highway. Each link of the National Old Trails route—for so it most appropriately has been named—is a pulsating chapter of American history and a token of America's progress.

The roads that form the National Old Trails route were baptized in the blood of native and alien soldiers and intrepid adventurers. The trails are flanked by the unmarked, unhonored graves of the early pioneers. Herds of deer and bison have roamed over the roads. Indian moccasins have left their imprint upon them. Troopers, in coats of red and buff, blue and gray, have trod them. Prairie schooners have shook them with creaking rumblings. If



*The Van Bibber inn on the Boon's Lick road and famous in Missouri stage coaching days*

you seek history at its pristine source, travel these old trails for upon them you will find it and while running, you can read, yes live, it. If you would be thrilled with the spirit of the pioneers, follow these highways of yesterday to lands of tomorrow. If you would learn of the commercial enterprise, the agricultural greatness and the scenic beauty of the United States, a trip over these roads will teach you of them. And the tour will not be arduous. Half the entire length of the National Old Trails route has been macadamized. It has been marked in each of the twelve states through which it passes—namely, Maryland, Pennsylvania, West Virginia, Ohio, Indiana, Illinois, Missouri, Kansas, Colorado, New Mexico, Arizona and California.

#### **Road Blazed by Washington**

The eastern link of this romantic highway is Braddock's road, a 135-mile thoroughfare that joins Washington and Cumberland. It is older than the republic itself, being blazed by George Washington, then a loyal subject of King George II,

and Nemacolin, the Indian guide, as a forest trail between the Potomac and Monongahela rivers in 1752, 24 years before the liberty bell cracked in its jubilant tolling of the news of America's independence.

Over Braddock's road the hot-tempered and obstinate English commander marched to his death in the unsuccessful and sanguinary expedition against Fort Duquesne in 1755. On that road Braddock's red-coats, fighting a hidden foe and dying undismayed in the open, gave to the world an exhibition of gameness and courage that is the Briton's heritage. In that road, so the old story goes, Braddock was buried after a French bullet had silenced forever the lips that would not give the merciful command, "Retreat." On either side of that road the Virginians found an ambuscade from which they covered the despairing retreat of the English soldiers who, after the slaughter by French and Indians, formed but a pitiful remnant of that splendidly disciplined army which Braddock recruited for the American campaign.

#### **Second Link Road of Peace**

Although less tragic in its origin, the second link in this transcontinental highway is equally as historic. It is the Cumberland road, 676.6 miles in length, touching Uniontown and Washington in Pennsylvania and Wheeling in West Virginia, crossing the states of Ohio, Indiana and Illinois and having its termini at Cumberland on the east and St. Louis on the west. Unlike Braddock's road, hacked through the forests for the troops and troop trains to follow, the Cumberland road is a highway of peace, conceived and built by the federal government to speed the settlement and development of the northwest territory and the vast empire secured by the Louisiana purchase from France in 1803.

The construction of this government road through the wilderness goes back to the presidency of Thomas Jefferson. In 1802 Ohio asked to be admitted to the union and Albert Gallatin, secretary of the treasury, promised that 5 per cent of the funds accruing from the sale of public lands should be used to build a cross-country



*The famous bottle bridge east of Frederick on Braddock's road; built in 1808*

highway from Washington to the Mississippi river. The work was started immediately and during the next 35 years the roadway was established through Pennsylvania, West Virginia, Ohio, Indiana and Illinois.

#### **Issue in Presidential Election**

Part of the Cumberland road was constructed first of earth, plant matter and split logs and was in such wretched condition by 1824 that its improvement was made the paramount issue of the presidential campaign of that year. Two hundred and seventy miles of the highway, however, was macadamized by the government in the early years of the nineteenth century. Much of the improvement remains intact and other parts have been rebuilt so that now the entire stretch, from Washington to Wheeling, is in almost perfect condition.

The Cumberland road ceased to be a government project in 1837 when the public land grant was discontinued and the highway reverted back to the states through which it had been built. It never



*Map showing the course of the National Old Trails highway across the continent and the five historic links of which it is made*



*A section of the Old Trails road in Maryland where the motorist rides in the wake of Braddock's redcoats*

reached its proposed western terminus, St. Louis, Vandalia, Ill., being its end when Uncle Sam unwisely decided that such a thoroughfare no longer would be needed with locomotives already puffing on the iron trail.

The third link, the Boon's Lick road, measures 170 miles and extends from St. Louis to Franklin, Mo. A century ago it was the most famous highway in the central west. Surveyed in 1815 from St. Charles, 25 miles west of St. Louis, to Franklin, 150 miles farther west, it turned immigration towards central Missouri and 6 years later brought Missouri into the union as a state.

#### The Road That Made Missouri

The making of roads results in the building of commonwealths. The Boon's Lick road is notable but almost forgotten proof of this axiom. It was the road that made Missouri. It was the parent of the Santa Fe trail, which, extending west across the plains, brought commerce and settlers to Kansas, Colorado and New Mexico.

The Boon's Lick road is a memorial to Daniel Boone, the great pioneer of the west, and his two sons, Daniel and Nathan, who in 1804 settled in the wilderness of central Missouri and made salt at the salt springs to which the deer had guided them. The only white men in the territory west of St. Charles, the Boones and their companions boiled the spring water in huge iron kettles and floated the crude salt that formed the residue down the Mississippi in hollow logs to be sold at the French village of St. Louis.

Two years later, a settlement of English-speaking people was made near Boon's Lick and shortly afterward the town of Old Franklin, 12 miles distant, was founded on the Missouri river. Immediately there arose the necessity for a highway between Old Franklin and St. Louis and

St. Charles, then the metropolises of the new west, each with several hundred inhabitants. The Boon's Lick road was the result.

It was not much of a road judged by modern criterion. It was neither macadamized nor paved nor graveled. Indeed, in its early days it was little better than a trace or a hint of a road's direction. The surveyors sought the easiest grades and the shortest ways, however, and to this day the Boon's Lick road and its western extension, the Missouri link of the Santa Fe trail, is the most level and shortest highway across the state. The two Boones—they were Chaucerian spellers and affixed the "e" to their name at pleasure—ran a line that followed the ridge or watershed between the Missouri and Mississippi

rivers. There were no bridges. The smaller streams were forded. On the large rivers were primitive ferry boats, hollow log canoes locked together. The sign posts were "blazes," marks cut in the bark of trees along the roadside. The road machinery consisted of a rifle, an ax and a grubbing hoe. Into the wilderness where hostile redskins threatened the builders on every hand, the Boon's Lick highway ran.

#### Trail of Crimson Romance

A path of romance is the fourth link of the National Old Trails route, the Santa Fe trail, which crosses level Kansas and cuts off a corner of mountainous Colorado to ramble over the great divide into the un-American city of Santa Fe. Thrilling tales of heroism and privation mark each foot of its 929 miles. The Spanish conquistador and padre trod it in the sixteenth century. Two hundred years later it was the great pathway of commerce and progress. Over it rumbled white-tented prairie schooners and creaking stage coaches, heavy with cargo and bullion. From end to end of the trail was an ear-splitting medley of whinnying horses and braying mules, the clank of chains, the crack of bullwhackers' whips, the war cries of Comanches and Utes.

The history of the conquest of the far southwest is the history of the Santa Fe trail. The romantic highway was first used by American traders in 1812 when William Becknell, with a party of thirty adventurers, set out from Old Franklin for Santa Fe. Without a tree or a path to guide them, they took an irregular course by observations of the north star and with the aid of a pocket compass. In the deserts of New Mexico they almost died from lack of water. In their desperation, the partially crazed men killed the dogs of the train and eagerly swallowed their hot and sickening blood.

Upon his return to Missouri, Becknell



*A Pennsylvania road made through the mountains by the government a century ago and now a part of the Old Trails highway*

excited the cupidity of other merchants and adventurers by his tales of the immense profits to be made on goods transported across the dangerous trail to the capital of New Mexico. More caravans were fitted out. Within a decade, the road to Santa Fe was crowded with trains of from twenty-five to thirty prairie schooners each. They crept across the prairies at a speed of 18 and 20 miles a day, the traders fighting the Indians en route and leaving their dead in silent heaps on the plains.

Thus the southwestern trade was born and thus the Santa Fe trail became a highway to fortune. It was a high and dry road, passable at all seasons, and in all its length, there was not a bridge or the need of one. So important had the road become in 1824 that it was surveyed by a government commission, headed by Senator Thomas Benton of Missouri, who at Council Grove and McPherson, Kas., made treaties with the Osage tribe for a perpetual right of way. Five years later, the secretary of war detailed four companies of infantry, under command of Major Bennet Riley, to escort the annual caravan and protect the traders from the attacks of the Comanches, Cheyennes and Pawnees.

#### In the Wake of Kearney

The fifth link in this chain of historic highways is known both as Doniphan's road and Kearney's road. From Santa Fe to San Francisco, it measures 1,886 miles and goes south through New Mexico to El Paso, crosses southern Arizona and after skirting the southern boundary of California, follows the coast line of the Pacific through San Diego, Los Angeles and Monterey to the Phoenix city of the west.

This western link, like the eastern link, is a road of conquest. Established by Coronado, the minion of Emperor Charles V, in his exploration of the new world, it served three centuries later as a trail over which the American troops marched to wrest from Mexico that vast empire north of the Rio Grande.

"Over this part of the road marched the invincible Missourians under Alexander A. Doniphan," writes the president of the National Old Trails Road Association, J. M. Lowe. "Through Kansas and Colorado and thence down over El Camino Real, the king's highway of New Mexico, marched these volunteers to the conquest of Chihuahua. There has been nothing comparable with it in all the annals of military history. William Cullen Bryant could think

of nothing in the realm of history with which to liken it, except the great march of Zenephon, and he only marched 3,465 miles, while Doniphan and his men marched more than 6,000 miles, principally through a hostile country. For more than a year they were absolutely out of touch with civilization—lost to their friends and the government at Washington. 'Rough, Ragged and Ready,' as Doniphan christened them, they marched on, fought the most brilliant battle of the Mexican war and added an empire to the United States.

"Over this road marched the little army of General Stephen Kearney to the conquest of California. In the last battle, fought almost upon the shores of the Pacific at Los Angeles, Kearney fell almost mortally wounded and consecrated her soil with his patriotic blood. Although bleeding profusely when the surgeons rushed to his aid, he, like the gallant soldier that he was, exclaimed 'Save my men first,' and



One of the many markers erected by the Daughters of the American Revolution along the Santa Fe trail

fell there in a faint.

"Thus the National Old Trails road began in baptism of blood in the establishment of Braddock's road on the extreme east, and thus it ended in a like baptism on the shores of the Pacific."

The five old trails are as prolific in scenic beauty as they are in historic interest. In the east, the course of the road is through the low, wooded foothills of the Alleghanies, up and down gentle grades where youthful for-

ests are green in summer. Then it goes through the corn fields and pastures of the middle states and across the turgid Mississippi into Missouri. It leads to Mineola Rock, mute reminder of red days gone by, and to Danville, the deserted village; now topping a hill with a glorious vista of fields and woodlands ahead, then skirting on high bluffs the Missouri river, gleaming golden in the sun.

Over a long stretch of perfect roadway beside which the grass and clover is waving, it goes into Kansas City and then hurdles the Missouri river into Kansas, state of goldtopped sunflowers and endless wheat fields. It goes through Council Grove, where deliberated the Indians in many a solemn conclave of peace and war; it passes by Pawnee Rock, a natural citadel of the plains, from which the redskins swept down on the prairie schooners to slaughter and pillage.

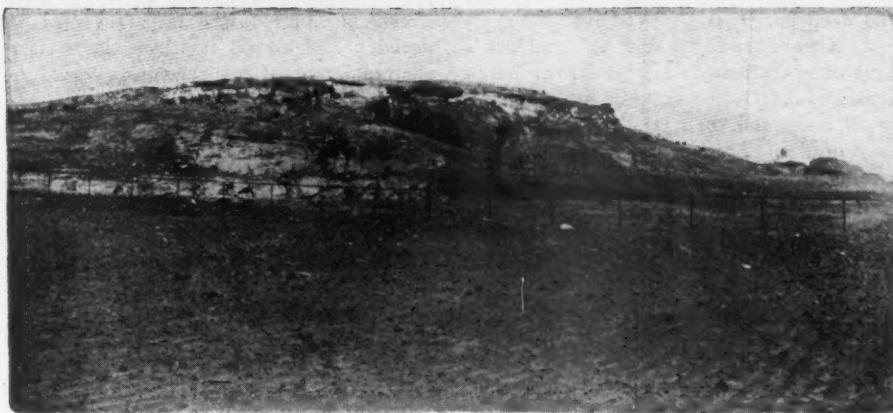
#### Scampers Along Rocky Ledges

It next invades Colorado where it scampers along the rocky ledges of majestic peaks to the Wagnerian music of mountain torrents. Winding in and out of the Rockies for 100 miles, it climbs over the great divide to New Mexico, realm of romance, land of enchantment, where the mesas and deserts are splashed with colors, where the Indians live in terraced houses that have withstood the ravages of centuries, where the bats keep vigil and the eagles make nests in the prehistoric dwellings of the stone-age man.

In its rambling across the state of Arizona, the road barely avoids the grand canyon and tempts the tourists to make a detour to that most impressive of nature's wonders—that colossal multi-colored gash in the rocks, burst up stern and grim like the wild playground of monster giants. At Needles the trail enters California and following the shore line, skirts by fields of fruit and flowers and offers an opportunity to drive on the most magnificent system of state highways in the country.



Nearing Kansas City on the Santa Fe trail link, once the highway of the traders to the El Dorado of the southwest



Pawnee Rock, the most dangerous point on the Santa Fe trail in the red days when the Indians challenged the advent of the traders

Thus, in sweeping generalization, can the scenic beauty of the National Old Trails route be described.

The linking of the five old trails to make an ocean-to-ocean highway is not a new project. Almost a century ago, soon after Missouri became a member of the union in 1821, Thomas Hart Benton, the new commonwealth's foremost senator, started in congress the agitation for a transcontinental route. He knew the need of such a highway. He foresaw what its construction meant. He had watched the hardy pioneers venture further and further into the unexplored western country. He had traveled these trails which they had laid out; he had followed them through the forests of Missouri and over the Indian-infested prairies of Kansas.

#### The Oldest of Engineers

"There is a class of typographical engineers older than the schools and more unerring than mathematics," he told the senate with all the magnificence of his oratory. "They are the wild animals—the buffalo, the elk, the deer, the antelope and the bear—which traverse the forests not by compass but by instinct that leads them always the right way, to the lowest passes in the mountains, the shallowest fords, the richest pastures in the prairies, the best salt springs and the shortest practicable lines between remote points. These are the first engineers to lay out a road in a new country. The Indians follow them and hence the buffalo road becomes the warpath. The white hunters follow the same trails in pursuing their game. After that the warpath becomes the wagon road of the white man and finally the macadamized road of the scientific man.

"This central highway, the transcontinental highway of tomorrow, will follow from the nation's capital to the Golden Gate the Cumberland pike, the Boon's Lick road, the Santa Fe trail on to California, the 'Land of Sunshine,' the central historic highway across the continent."

Senator Benton, orator and trail-builder, also was a prophet. The new Santa Fe

trail has been built and laid out from ocean to ocean. It follows today almost the same route outlined by the Missouri statesman so many years ago.

#### Missouri Fathers Road Revival

Interest in the five historic roads was revived in 1911 when the Daughters of the American Revolution proposed that these old trails be perpetuated by linking them in a modern highway. Missouri fathered the project. The Missouri chapter of the Daughters of the American Revolution succeeded in getting its commonwealth to adopt the Boon's Lick road and the Santa Fe trail as its first state road. The Missouri Old Trails Association was organized and a call for a convention to form a national association was issued. The convention was held in Kansas City in April, 1912, and was attended by more than 500 delegates appointed by the governors of the states through which the route runs.

The government was asked to co-operate in the movement, to fulfill unredeemed pledges, given to Ohio, Indiana, Illinois and Indiana in which congress promised to use one-twentieth of the net proceeds from the sale of public lands to build a road

across these states. A bill, introduced by Representative Henry A. Barnhart of Indiana and calling for an appropriation of \$5,000,000, is now pending in congress. If it passes, Uncle Sam will resume work on the transcontinental road which he started to build in 1802 but never finished.

#### Improvements All Along the Line

Although its route was not definitely settled until 1912, the National Old Trails road is being rapidly improved from eastern to western terminus. Pennsylvania is macadamizing its section. Maryland and West Virginia are making the Cumberland pike the superior of the road that Henry Clay once declared the finest in all the world. Ohio and Missouri have adopted their links as state highways and have contracted for their permanent construction. There are but a few improvements to be made in the Indiana section. Illinois, the laggard, has been awakened recently from its lethargy and is planning to mitigate its shame. The long stretch across Kansas is an excellent earth road in dry weather and the several counties which it traverses are voting bonds for improvements. In Colorado, New Mexico and Arizona convicts already have worked miracles with dynamite and pick in the mountain regions and are making modern the old trail through these states. California can sit complacently by and watch the other commonwealths toil. Her highway system is practically complete.

As you ride over the old trails and are reminded by frequent landmarks of epochal events that occurred a century or more ago, you wonder why, in the days of date memorizing, you so abominated the study of history. For, as you wander over the historic highway, you become obsessed with the desire to delve deeper into the source books and there read of the heroism of those men who have gone before you, men who faced death each mile they traveled.

You become inspired with the spirit of



A section of the old Cumberland pike near Frostburg, Md., a road that was a bone of political contention in the presidential campaign of 1824

the past before you leave Washington. As you follow Braddock's road you are living in another century, a century in which two mighty nations fought for the ownership of a rich western empire. The phantoms of Washington and Nemacolin and Braddock are your guides. In your imagination you are wearing a red coat and carrying a musket and plunging into the wilderness.

"The building of Braddock's road in 1755 across the Alleghanies was the first significant token in the west of the British grit which finally overcame the natural obstacles which the French blindly trusted as insurmountable," writes Archer Butler Hulbert in his "Historic Highways of America." "Few roads ever cost so much, ever amounted to so little at first, and then played so important a part in the development of any continent."

Although slaughtered like hogs in an abattoir and routed in the battle of the Monongahela, Braddock and his men marched not in vain through the wilderness. Staining the road with their blood, they cast before them a shadow of what British pluck and courage would ultimately accomplish. In the wake of such men you are traveling.

#### The Town of Barbara Frietchie

At Frederick, Md., 43 miles northwest of Washington, you change your coat of red for one of gray and you are riding under the flag of the confederacy. More than a century has elapsed and Stonewall Jackson, not Braddock, is your leader. Far down the street a lone banner with stars and stripes flutters in the September breeze and a gray-haired woman, standing on the balcony of a white-pillared house, glares defiance at the greatest strategist of the civil war and the rough troopers whom he commands.

Ride two blocks more and your imagination leaps back to the previous century as you pass the old barracks used by the Hessian troops during the revolution and the headquarters of General Washington.

Five miles further on is Braddock's Heights, an eminence from which four states can be seen. At Hagerstown, 69 miles from Washington, you are in a town that was a constantly changing pawn on the civil war checkerboard. It seems that you yet can hear the thud of horses' hoofs as their riders in blue and gray dash through the town to clash at Gettysburg, 28 miles to the northeast; Antietam, 12 miles away, and South Mountain, 10 miles distant, with Bloody Lane, Dunkard Church and Burnside Bridge nearby.

Twenty-six miles east of Hagerstown, on the road to Cumberland, is Hancock, a village founded by John Hancock in 1769. Here stands the old Barton house, where Washington, Jefferson, Jackson, Harrison, Clay and Webster stopped in the staging days. After a drive along the Potomac, where the magnificent scenery more than compensates for the steep climbs and descents, you come to Cumberland, cradled

at the foot of three mountains and near the deep gorge of the Narrows.

At Cumberland you are at Braddock's base of operations in his disastrous march against Fort Duquesne. For approximately 20 miles the road is level with a few easy grades. Then it starts to climb and crosses a succession of mountain ridges which average about 2,700 feet in height. Beyond Farmington, the old earthworks of Fort Necessity still can be traced and a few miles east of Uniontown the tourist passes Braddock's grave, unmarked and often unobserved because of its obscurity. Beside a brook that bears the name of the English commander, beneath a cluster of solemn pines, his dust lies. Near a group of gnarled apple trees in the meadow beyond, Braddock died and was first buried, buried in the center of the road that his soldiers had hacked through the forests. The beat of their retreating feet and the army wagons passing over the newly made grave obliterated all traces of it and saved the body from desecration by the blood-crying Indians who could not find the burial place to scalp the dead leader.

"The traveler at Uniontown is within striking distance of Braddock's road at its most interesting points," writes Professor Hulbert in his "Historic Highways of America." "A 6-mile climb to the summit of Laurel hill brings one upon the old-time route which will be found near Washington's Spring. A delightful drive along the summit of the mountain northward brings one near the notorious 'Dunbar's Camp,' where so many relics of the campaign have been found and of which many can be seen in the nearby Pennsylvania Soldiers' Orphans' Home. Here Dunbar destroyed the quantities of stores and ammunition with which he could not advance, much less retreat."

At Uniontown

*"The tumult and the shouting dies,  
The captains and the kings depart."*

and the route the remainder of the distance to Wheeling is unstained by the blood of Mars' minions and the motorist is traveling the road of the early emigrant and western settler, conqueror with ax and hoe. For the tourist is now rolling along the Cumberland pike, highway of peace leading to fields of plenty.

#### Old State House at Vandalia

Few indeed are the points of historical interest along the entire route from Wheeling to St. Louis unless you except Vandalia, capital of Illinois in the early days of the nineteenth century, where the old state house still is standing. Nevertheless, you are driving over a highway as historic as it is excellent. In the halls of congress in 1824, its impassable condition was deplored and its immediate rebuilding advocated. Henry Clay, John C. Calhoun and John Quincy Adams raised their voices in support of the bill appropriating funds for its improvement. The bill was

passed almost unanimously to be vetoed by President Monroe who later reversed his decision and signed it when his advisers showed him that his opposition would result in the loss of Whig power.

When once across the Mississippi you enter a region rich in historic lore. The Missouri links of the transcontinental highway, the Boon's Lick road and Santa Fe trail, pass through the most historic section of the state. The history of Missouri harks back to these old trails over which rode, in stage coach or on horseback, the men who controlled the political destinies of the commonwealth.

#### Historic Spots in Missouri

At St. Charles may be seen the first capital of Missouri and the executive mansion occupied by the first governor, Alexander McNair. Along the road the motorist may visit the stone house where Daniel Boone lived and died, the first stone house to be built west of the Mississippi; Pondfort, raised by the early settlers as a protection against Indian attacks; the Jones tavern, dating back to 1829; Pauldingville, where Rodman Kenner, prince of fiddlers, kept tavern; the Van Bibber inn, where the Boones lived and which was famous in Missouri stage-coaching days; the deserted log cabin where was the first school of girls west of the Mississippi; beautiful Mineola Springs, called by Thomas H. Benton the "Bethesda of the West;" Loutre Lick and nearby the scene of Captain James Callaway's fatal battle with the Indians; the Graham house, erected in 1816; the Van Horn tavern on whose register Washington Irving scrawled his name; Franklin academy, the only building in the historic metropolis of Franklin to survive the flood of 1826; Big Gum spring, renowned as an Indian camping ground; the salt licks where the Boones made salt at the dawn of the nineteenth century; the Big spring at Arrow Rock; the birthplace of Kit Carson; the sites of Cooper's Fort, Fort Kincaid and Fort Hempstead; and the Lafayette county courthouse, scarred and pitted by cannon balls fired by the batteries in the decisive battle of Lexington.

At Kansas City the tires of your car begin to leave their imprint on the Santa Fe trail for which the now great packing center, then known as Westport Landing, was the eastern terminus when thousands of grim scouts, silent trappers and lawless traders traveled it to seek fortune in the far southwest. You are following too in the footsteps of Kearney's straggling army which marched out of Missouri, California-bound, to meet and conquer the Mexicans in the waste lands north of the Rio Grande.

A level road is the Santa Fe trail across Kansas and without a bridge or the need of one. Almost a century ago, when teams of oxen, horses and mules were pulling tons of freight across the prairies, its smoothness tempted a mechanic, named Thomas and living at Westport, to essay a voyage across the plains in a wagon

driven by sail. His plan was to haul loaded vehicles with his wind cart and thus revolutionize the Sante Fe trade. He also claimed that he would be free from attacks by Indians who, in superstitious fear, would flee from a boat that sailed on dry land. He got some otherwise sound business men of Westport to furnish money for his experiment and started on his maiden trip, but experienced difficulty in the low places where he was becalmed, the timber or hills shutting off the wind from his sails. At several places he was forced to hunt for a yoke of oxen to haul him onto high ground, but finally succeeded in getting to Council Grove before he abandoned his scheme as impractical.

Kansas is replete with landmarks of the sanguinary frontier days and the trail has been marked across the state with permanent monuments by the Daughters of

the American Revolution, assisted by the school children and under the supervision of the Kansas Historical Society. There is much to see on this stretch of the transcontinental tour—Black Jack, just east of Baldwin, where it is claimed that the first blood in the civil war was shed; the old Santa Fe well at Baldwin; the ancient oak tree at Council Grove under which the Indians and government commissioners made the treaty for the perpetual right-of-way; Pawnee Rock, the most dangerous point on the road in the days when the redskins challenged the progress of the traders; Dodge City, once a wide-open frontier town, the gambling hell, drinking Gehenna and shoot-'em-up Hades of the "Nickel Awful;" and a factory at Olathe where are cut and sewed by hand the admiration-commanding boots worn by the Beau Brum-

meles of the cattle camps of the far western plains.

In Colorado there are majestic mountains and deep canyons; in New Mexico and Arizona, wonders of nature and prehistoric villages that thrived before the birth of Christopher Columbus; and in California there are the Spanish missions where the devout padre taught the savage and gave him his blessing.

The scenic beauties, the historic spots of the National Old Trails road cannot be enumerated. They must be seen. With the seeing comes true appreciation and a knowledge of what sacrifices were made, what privations and tortures were suffered by the men who trod the old, old road when it led through a territory where Death was a tribute-extracting monarch.

The old, old road is beckoning. Will you come?

## European War Affects the Price of Crude Rubber

### Some American Makers Advance List on Tires

**N**EW YORK, Aug. 12.—The price of tires has been raised from 10 to 20 per cent by nearly all the larger tire companies. The action is due to the effect of the European war upon the crude rubber situation, the price of the crude product having advanced 100 per cent in the 8 days ending last Friday, August 7.

Crude rubber is just as plentiful as ever, but the war has tied up the London rubber market, through which most of the rubber used in the United States is bought, and English ships, which carry most of the rubber from East India and Brazil, are wary about navigating when hostile battleships are likely to molest them.

After affairs adjust themselves it may be possible for neutral vessels to supply the demand by transporting para rubber from South America; also the war may not last long, all of which may relieve the situation, but as it is the majority of American tire builders have no more than enough to last them from 6 weeks to 3 months.

The tire-buying season, however, is about over. July and August are the two big tire months of the year and in September the demand falls off as touring declines. For this reason tire manufacturers generally carry a low stock of crude rubber at this time of year and work the made-up stock down low in cleaning out for the following season.

Also, since manufacturers with long time contracts were badly "stung" a couple of years ago when the price dropped, they have bought more or less from month to month ever since and none of them carries very heavy stocks. Whatever contracts exist are for a certain quantity to be delivered every month and at this time the rubber traders are unable to fulfill their contracts.

The price of tires, beginning nearly a year ago, dropped a total of 28 per cent. This was due to competition and a low price for crude rubber. The present increase has sent it about half way back and whether other increases are contemplated would not be stated by the tire men.

Should the war end in a short time, one tire man stated, the price of crude rubber would probably go lower in this country than it had been. This, he said, would be caused by the inability of European factories to recover their normal condition and take the rubber offered by the world's markets, all of which rubber would be sent to this country and glut the market.

The tires which are being sold at the present time and on which the price has been raised are not being made from the crude stock on which the price jumped. The increase in tire prices is based more upon a feeling of apprehension as to future conditions and it will be several weeks in most cases before any of the high-priced crude is made into tires.

Because of this some of the manufacturers have declined to raise until the cost of production increases. The Kelly-Springfield, Ajax-Grieb and Michelin companies are standing pat on their former prices and the attitude of those who state that they will not raise is indicated in the statement of Van H. Cartmell, president of the Kelly-Springfield Tire Co.

"We always base our selling price on our manufacturing cost," he stated, "and while we are able to manufacture at former and present prices we shall not raise the retail price of our tires. If the war should continue and it becomes necessary for us to make future purchases of crude rubber at advanced prices we would increase the selling price in proportion to the advance in the manufacturing cost."

Horace de Lisser, chairman of the board of directors of the Ajax-Grieb Rubber Co., expressed a like sentiment. Mr. de Lisser urged manufacturers to avoid frenzy and said no increase would be made in Ajax tires until the cost of making them was increased by the necessity for purchasing crude rubber at advanced prices. This company is not heavily stocked with crude or tires, but is selling at former prices.

The increases made range from 10 to 20 per cent, the average being from 12.5 to 15 per cent. The highest increase was made by the Goodyear Tire and Rubber Co., Akron, O., which advanced 20 per cent. The Fisk Rubber Co., Chicopee Falls, Mass., was next in line with 15 per cent.

Goodrich and Diamond tires went up 12½ per cent, as did Empire, Pennsylvania and United States, Republic's increases, like that of Firestone, ranges between 12½ and 15 per cent.

Federal, Racine, Lee, McGraw and many others have not made advances and state that they have not yet made decision.

Swinehart did not raise its list price, but instead cut the discounts given to the dealer and the consumer. Where the dealer got, for instance, 10 and 10 he now gets 10 only and where the consumer got 10 and 5 for cash he now gets 5 for cash. The dealer is credited with having cut from the list under the previous arrangement, so that in order to make his former profit he will have to sell at list without a cut.

The movement in solid tires is erratic. United States boosted the price 15 per cent, while others state that they will not raise or have not made decision. It was

Tire importers have supplies on hand for about 6 months and hope their European factories will be running again by the first of the year.



## Tire Conservation the Watchword

CAR owners are face to face with a raise in prices of tires approximating 15 to 20 per cent with the prospect of still higher prices should the European war continue and prevent the importation of crude rubber from Ceylon and the East Indian settlements whence it comes via London. The east provides nearly 70 per cent of the crude rubber used in America, in spite of the fact that para gum from Brazil is considered the best gum in tire manufacture. The para is used, but compounded with the late rubber which comes from the plantations of Ceylon and other eastern points. This rubber reaches America on British ships, as does the Brazilian supplies, and until quiet is restored on the high seas it is going to be difficult to have supplies reach New York. Already the price of crude has jumped from 55 cents to \$1.10 per pound in 10 days and with little surplus in New York, with very little in London and not much on the seas there is prospect of still higher crude prices, in fact, the limit is an unknown factor, dependent entirely on the extent to which the war activities continue to paralyze ocean shipping.

IF our shipping with Brazil were accomplished on neutral vessels, which is possible, these still remains the fact that the crop there will not come until after October 1, a time when touring for the present season is over. Fortunately, many of our rubber factories have supplies on hand to run them 6 weeks, 2 months and in some cases 3 months. Ordinarily the tire manufacturer carries a larger supply, but the present time is practically the close of his manufacturing year and naturally stocks are low. The tire makers have not carried large rubber stocks during the past year or so, as several of them got caught with large stocks of crude rubber on hand when the prices broke over a year ago. Since then there has been more hand-to-mouth buying and so the present acute crisis has found them in a particularly poorly prepared condition. **MAKING THE BEST OF A BAD CONDITION IS THE BEST POLICY FOR CAR OWNERS TO FOLLOW. GIVE MORE ATTENTION TO YOUR PRESENT TIRES AND YOU MAY GET 1,000 OR MORE MILES ADDITIONAL OUT OF THEM.**

THERE are very few motorists who get the mileage that is possible. This is largely due to carelessness. In many instances little if any attention is given to keeping the tire treads in good condition. After the summer tour the treads are cut, and if these are not repaired the water will enter, reach the fabric and begin destruction that will amazingly soon end in a blowout.

THIS can be avoided by having the crack or cut vulcanized or filled, if not too large, with some of the tire fillers marketed for this purpose. It is worth while to take this precaution and car owners will find much additional mileage possible by such a precaution. The average owner may be slow in appreciating the necessity of watchfulness as to these details, but he is certain to be rewarded in extra mileage if he looks after his tires at the end of the season. A little attention then will give him extra service that he will appreciate, especially if prices soar because of the possible shortage of crude rubber.

**H**EAT is a great destroyer of tires, and is responsible for more blowouts and troubles in the hot touring months than stones and other difficulties. With high air pressures on hot black roads, the tire temperature rises very rapidly when speeds of 30 or 35 miles per hour are maintained for long distances. Not infrequently when a tire blows out the tire is too hot for the hand and the rim frequently much hotter. This can be avoided by traveling at a slower pace. Cutting the speed 5 miles per hour will show a decided difference in mileage.

**I**T is advisable when driving in hot weather to give more attention to the tire inflation. Often the tire is inflated to 75 or 80 or 90 pounds, the air being taken in in the cold garage in the early morning. The car is then driven over the hot black roads on a day with the thermometer at 95 or perhaps higher. The tire pressure has risen very materially and it will pay a driver to stop in the middle of the forenoon and use his pressure gauge to note the inflation pressure and reduce it a little. This looks like trouble, but will repay all efforts in longer tire life.

**T**HE inflation which you drive at largely depends on the nature of the road. On a hard rough road it is best to reduce pressure as compared with driving on a softer dirt or clay road. White gravel roads are much cooler than black oiled highways. We all remember the old simple experiment of laying the black and white checkered cloth over the snow on the bright winter day. The snow is melted beneath the black checks but not under the white ones. In a word, black absorbs the sun's heat. The same is true of road surfaces, the black surface absorbing more heat than the white surface. Watch your tire pressures more on a black road than on a white one.

**T**IRES inflations should be given the most careful attention. Frequently the pressure will drop in a day or so and yet it is difficult for you to detect it when looking at the tire as the car stands in the garage floor. If you are an expert you can tell by the ring you get when sharply striking the tire with your shoe toe. This method cannot always be depended upon. The pressure gauge is really the only trustworthy means. Get in the habit of using the gauge once, twice or three times a week. If driving every day on a tour it will repay you in these days of higher prices to try your tires every morning if you have old tubes and every other morning or every second morning with new tubes. It is not uncommon to see pressure drop from 70 pounds to 45 pounds in a couple of days with old tubes and yet the tire stand up well on the garage floor with the car empty.

**E**VERY owner has several avenues of overcoming the present increase in tire prices by giving more attention to his tires. It will be a good schooling in the work. At first the extra attention may be burdensome, but it will soon become habit, as filling your battery with water does.

# Twenty-Four Cars Nominated for Elgin Road Races

## Classy Field Named for Kane County Classics

CHICAGO, Aug. 12—The fifth annual Elgin road races are only a little more than a week away and it now looks as if the Kane county classics will excel anything ever before held in this country; perhaps not in point of speed when compared with Santa Monica, but certainly superior to any other road race in the matter of entries.

The lists do not close until Saturday night but from the looks of things now it would seem as if there will be at least thirty cars go to the tape in each of the events, scheduled for August 21-22. The class of this field cannot be questioned, for already enrolled is nearly every star driver in the country, but the fastest of cars as well, including six of foreign manufacture and one of them a French grand prix Mercedes, the one which was driven to second place at Lyons by Louis Wagner.

With twenty-four cars already enrolled, there is a certainty of at least a half-dozen more being booked before the end of the week. The Chicago Automobile Club has been handicapped by the A. A. A. rule forbidding more than three cars of a make starting, having been forced to turn down a Mercer and a Stutz that were to have

been nominated. The list to date is as follows:

No.	Car and entrant	Driver
1	Peugeot, E. J. Schroeder	Not named
2	Stutz, Stutz Motor Car Co.	B. Oldfield
3	Stutz, Stutz Motor Car Co.	G. Anderson
4	Sunbeam, W. Ziegler, Jr.	H. Grant
5	Sunbeam, W. Ziegler, Jr.	G. Babcock
6	Peugeot, L. C. Erbes	R. Burman
7	Marmon, C. E. Erbstein	L. Heinemann
8	Stutz, W. Ziegler, Jr.	F. H. Dearborn
9	Mercedes, E. C. Patterson	R. de Palma
10	Duesenberg, Fred Duesenberg	E. Rickenbacher
11	Braender Bulldog, W. Chandler	W. Chandler
12	Duesenberg, Fred Duesenberg	Not named
13	Tahis, F. Robinson	M. Roberts
14	Mercer, Mercer Automobile Co.	S. Washart
15	Mercer, Mercer Automobile Co.	E. Pullen
16	Mercer, Ed Schillo	C. Luttrell
17	Gray Fox, Frank Fox	H. Wilcox
18	Peugeot, Peugeot Import Co.	R. Mulford
19	Peugeot, Peugeot Import Co.	L. Fountain
20	Lozier, R. H. Knowles	M. Stringer
21	Marmon, C. E. Erbstein	M. Stringer
22	Marmon, Moross Amusement Co.	W. D'Aleme
23	Maxwell, Moross Amusement Co.	T. Tetzlaff
24	Maxwell, Moross Amusement Co.	W. Carlson
25	Maxwell, Moross Amusement Co.	Not named

### COLUMBUS SANCTION REVOKED

New York, Aug. 12—Special telegram—Chairman Kennerdell of the A. A. A. has cancelled the sanction issued to J. Alex Sloan for racing on the Columbus, O., track, August 15, because of the strong sentiment against track racing in Columbus by the Columbus Automobile Club and the Ohio State Automobile Association.

There was a fatal accident at a meet on this track last year and both the club and state associations claim that the general sentiment in the territory is opposed to sanctioning any meets in the city.

### HARTFORD PLANS PUBLIC PARKINGS

Hartford, Conn., Aug. 10—Hartford's traffic problem is assuming such proportions that plans now are being made for a public parking place on Jewell street from Memorial arch to the Heublein hotel. Jewell street recently was widened to twice the original size, thus doing away with a dangerous curve at the Y. M. C. A. building. There is an abundance of space along this stretch for the purpose suggested. Forty minutes is the limit for leaving cars unattended in the business district and this limitation has become somewhat annoying not only to the police but to the owners of cars as well. The proposed parking space is in the heart of the city and will accommodate 400 cars easily. It is proposed to charge 5 cents for leaving a car in the municipal parking space and to have police on guard while the cars are unattended. The Automobile Club of Hartford has agitated a municipal parking space for some time.

### French Road Race for Touring Cars Won by Sisz in Lorraine-Dietrich

PARIS, July 29—Angers has held a 231-mile road race for touring cars only, in which the winner was Francois Sisz, who drove a Lorraine-Dietrich at an average of 65.6 miles an hour. Although the winning machine carried four passengers and had the touring equipment required under the rules, it is only fair to state that it began life as a pure racer and even took part in one of the French grand prix races.

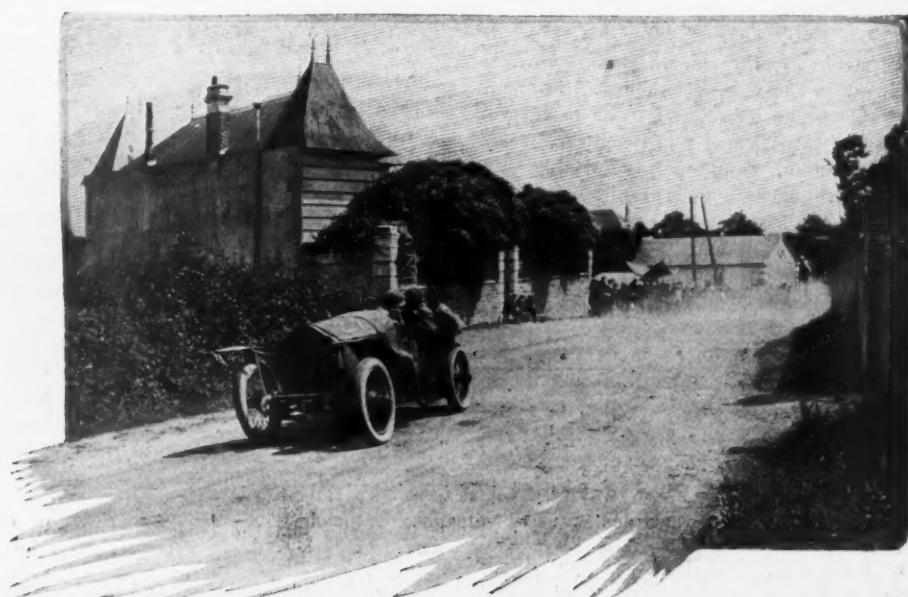
In contrast to the winner, which was a racer disguised as a touring car, there were about a score of others which were genuine touring car chassis equipped as much like racers as the rules would allow. The Lorraine-Dietrich, which has a piston displacement of about 670 cubic inches, was followed home by a Hispano-Suiza of only 183 cubic inches at an average speed of 58 miles an hour, this being maintained over a course of a difficult, winding nature.

Arthur Duray, in a Turcat-Mery, came third a little more than a minute behind the Hispano-Suiza. Fourth place went to a Cottin-Desgouttes, and fifth and sixth places to Chenard-Walcker cars of 3.5 by 5.9 inches bore and stroke. The faster of these two cars averaged a little more than 57 miles an hour.

An interesting performance was that of a little Gregoire of only 2.7 by 5.5 inches

bore and stroke, which won tenth place at an average of nearly 52 miles an hour. This was a stock car driven by Bignan, the designer of the motor, and was put in at the last moment when the car originally entered had to be withdrawn owing to an accident. The following is the summarized result of the race, in which twelve cars finished:

Pos.	Car and Driver	Time
1	Lorraine-Dietrich, Sisz	3:31:06
2	Hispano-Suiza, Antoine	3:58:57
3	Turcat-Mery, Duray	3:59:39
4	Cottin-Desgouttes, De Franck	4:00:19
5	Chenard-Walcker, Glaszmann	4:04:41
6	Chenard-Walcker, Dauvergne	4:10:51
7	Aquila-Italiana, Leduc	4:10:52
8	Nazzaro, Baratteau	4:26:01
9	Hispano-Suiza, Bara	4:27:06
10	Gregoire, Bignan	4:37:49
11	Rolland-Pilain, Sire	4:56:15
12	Seap, Molet	4:59:54



SISZ, IN LORRAINE-DIETRICH, WINNER OF ANGERS ROAD RACE FOR TOURING CARS

# European War as It Pertains to the Motor Car Industry

## Latest Mail Advices as to French Situation

By W. F. Bradley

**P**ARIS, Aug. 1.—It is difficult to conceive the disastrous consequences the threat of war has had upon the French motor car factories. All purchasing has stopped, and where cars are ordered but have not been delivered customers are refusing to take them over. Workmen are being discharged from all the factories, and in many cases production is so low that the chiefs are taking advantage of the situation to carry out stock-taking. Should war break out the result will be to close three-quarters of the motor car factories in France. Not only would the demand cease with the breaking out of hostilities, but in very many cases so many men would be called up for military duties that it would be impossible to run the works. In one particular factory every foreman and head of a department was required to do duty as a soldier within a week of the call to mobilize, and some of these men had to be at their post within 24 hours of the call.

Activity is confined to the aeroplane and aeroplane motor factories. The section of the Renault factory producing aeroplane motors is under army control; the same applies to the whole of the Gnome motor works, as well as to the Le Rhone factory. Aeroplane builders, as well as aeroplane motor manufacturers are forbidden to supply private customers.

Everything necessary has been done to put practically the whole of the Paris motor buses at the service of the army at a moment's notice should the call come. These vehicles would be rapidly transformed to act as meat wagons. Motor truck owners having subsidized vehicles have received intimation to hold them in readiness for delivery to the military authorities at any time.

A close inspection has been made in the various factories of the different types of cars which could be seized for army requirements if war breaks out. These cars would be used for carrying staff officers and would be driven by factory mechanics acting as military reservists. A considerable increase has been made to the reserves of gasoline, lubricating oil and motor car tires held by the army authorities.

With threats of a general war in Europe, all motor car demonstrations in France have been cancelled. The international 6-day trials for cyclecars and motorcycles, which should have been held in the Alps next week, have been indefinitely postponed. President Poincaré's official motor tour through the Alps has been abandoned. The annual trials for army motor trucks, which has been in progress around Versailles for the past 3 weeks, has been ordered to be stopped, the vehicles still in the competition being accepted as suitable for the government subsidies, and all being ordered to remain at the disposition of the government.

The three races at LeMans, on August 15 and 16, have been kept on the program and will be run if the political situation improves, while the date for receiving entries has been deferred. Even if the war clouds roll away the races will be adversely affected. There are three distinct events: the grand prix de France for 4½-liter cars, the motorcycle and cyclecar grand prix, and a light-car race. It now is certain that neither Delage nor Mercedes will run in the grand prix de France; this practically leaves the race in the hands of Peugeot, for its rival is Schneider.

## Many American Manufacturers Marooned in Europe

By C. G. Sinsabaugh

**C**HICAGO, Aug. 12—Many men prominent in the motor industry were caught in the war net when the European trouble broke out. Most of them are yet striving to get away and reach the United States again, while still others have been fortunate enough to make their escape. Among the latter is Carl G. Fisher, president of the Indianapolis motor speedway, and prominently identified with the Prest-O-Lite interests.

### Willys Now in London

Not so fortunate as Mr. Fisher, but safe in England, is John N. Willys, president of the Overland Company, who was in France when the trouble broke out, but he now is in London, apparently surveying the situation and in a position to come home at any time he sees fit.

L. B. Kilbourne, of Chicago, of Knight & Kilbourne, inventors of the Silent Knight motor, was in Germany when last heard from. Thomas L. Robinson, presi-

dent of the Republic Rubber Co., Youngstown, O., landed in Europe Saturday, just in time to get into the war net. Aaron Welheim, president of the Empire Automobile Co., at Indianapolis, is at Carlsbad, Germany, with his family, and nothing has been heard from him since the declaration of war. E. J. Moon, of the Moon Motor Car Co., St. Louis, Mo., is in London and the company has not heard from him since the war broke out. B. G. Work, president of the B. F. Goodrich Co., Akron, O., was in Germany when last heard from, and the factory has no advices as to the possible date of his return. A. J. Theisen, secretary of the Havers Motor Car Co., Port Huron, Mich., is in Berlin and the company has heard nothing from him since the war broke out.

Rene Petard, designer and chief engineer of the Lewis six, is seeing actual

service. Petard is a native of France and a captain of the reserve engineering corps. He was in France at the time the war broke out, testing out the new Lewis six, when he was ordered to the front. C. F. Redden, general sales manager of the Maxwell Motor Co., who was in France when the first shot was fired, managed to escape from that country and the last cable advices located him in London. The Maxwell company also reports that it has heard nothing from Arnold Foerster, its representative in Austria, who is a captain in the cavalry troop in Austria and who, it is thought, has joined his troop. Count Krysanowsky, a Russian in the Maxwell's foreign service, was last heard from in Paris on his way to Russia, presumably to join his regiment in Russia. Mr. Bennett, European representative of the Oakland and Buick, is one of those marooned in Europe at the present time.

August Duesenberg, of the Duesenberg

motor interests, crossed the Atlantic with Commodore Pugh of Chicago, who took with him Disturber IV, which was equipped with a twenty-four-cylinder Duesenberg motor and which was to have raced for the hydroplane trophy. Nothing has been heard from Mr. Duesenberg, but it is thought he is still in England.

W. R. Timken, president of the Timken Roller Bearing Co., was last heard from at Bad Nauheim, Germany, but since hostilities broke out the company has heard nothing from him.

#### Opinions of the Industry

All of the above information has been secured after a canvass of the American motor industry by Motor Age. The majority of concerns were fortunate enough to be able to report that none of their officials or heads of departments were caught in the war net. Some of these concerns, however, had interesting information or opinion on the war to express.

For instance, the Packard company reports that the French authorities had swooped down upon the Packard Paris branch and requisitioned the majority of cars there and that most of the Packard employees had joined the army. Despite the levy, though, the Paris branch still is in operation and Keith Goode, representing the Packard interests there, cables from London that everything possible is being done for Packard owners who have succeeded in reaching the British metropolis. Goode also cabled that at the present time gasoline is selling at \$2 per gallon in London.

R. N. Goode, who is in charge of the Paris branch, was in Detroit at the time the war broke, attending a convention of dealers at the factory. However, he now is on his way back to France, instructed to look after the interests of Packard owners as far as possible.

John N. Willys, president of the Overland company, just prior to the war breaking out, wrote his factory very fully on the situation as it existed at that time.

"The English are not slow to see the great opportunities for trade extension given to the United States by recent events," writes Mr. Willys. "Sir George

Parish, England's foremost financial writer, declares that the war will bring great wealth to American industries and an economic benefit to the people of the United States. He prophesies that Americans will be able to sell their crops at prices which will give them a much larger income than could possibly be realized had there been no war or danger.

"The call for army reserves throughout Europe has completely demoralized the industries on this side of the Atlantic. Many of the largest motor car factories have practically been unmanned. Only a very small number of motor cars will be built in Europe until there is a cessation of hostilities and the warlike atmosphere has cleared.

"In the meanwhile the entire field will be open to the American motor car manufacturers. There may be some difficulty in shipping cars to European ports, as they may be declared contraband goods, but the rest of the civilized world will be free from European competition and is America's for the taking.

#### U. S. Business Conditions

"Business conditions throughout the United States are sound. Our financial system is backed by the strongest national resources in the world. Our banks, safe and solid as they are, have been rendered doubly secure by the federal reserve and the great amount of emergency currency recently put into circulation.

"The great need of the United States, as seen with the perspective of the Europeans, is internal peace. In this world crisis American citizens should forget all petty animosities and narrow political agitations. There should be no interference with the orderly processes of business. The administration should assist in maintaining the satisfactory and fortunate condition in which the country finds itself. With the rest of the world at swords' points, our own peace and prosperity should be doubly appreciated."

The Maxwell company reports that a shipment of its 1915 cars, consigned to Tsingtau, China, has been held up in Vancouver. Two of these cars had been sold to Germans residing at Tsingtau, while

others were going to customers farther inland. The Maxwell company also had several large consignments in New York ready for shipment to foreign countries, which have been held up indefinitely.

The Pilot Car Sales Co., at Richmond, Ind., which had just perfected arrangements for shipment of cars to two of the countries involved, has withheld shipment.

#### Other Reports

The Rutenber Motor Co., Marion, Ind., advises that it has heard nothing from its European representative, R. A. Rothermal, of Paris, and that so far as its business in Europe is concerned, affairs are at a standstill. The company reports that Mr. Rothermal has worked up an excellent business on the continent.

"B. F. Tobin, our president, had planned to sail for Europe on August 12, but, of course, his trip has been abandoned," writes the Continental Motor Mfg. Co., of Detroit. "The war has, of course, stopped our progress in the countries that are involved, but we look for new business in countries farther east. Our shipments to England, Germany and France, are held up until further advices, although our customers in England feel rather hopeful for an early settlement of the affair."

"We believe all the real shipments destined for European points arrived before it was too late for acceptance," writes A. Langenbache, head of the export department of the Reo Motor Car Co., of Lansing, Mich. "At any rate, drafts were paid in New York city, so we are entirely protected. It was necessary, however, for us to discontinue shipment for all points and we have a number of unfilled orders which cannot be taken care of until shipping conditions permit. We were most seriously affected on the commercial car end of the business, and while we had some shipments in New York city ready to load on boats, these all have been taken over by our branch for storage."

"While we feel that the war in Europe is going to interrupt sales for ourselves and other American manufacturers, the war itself will make a greatly increased demand in the long run," advises the Oakland Motor Car Co., of Pontiac, Mich.

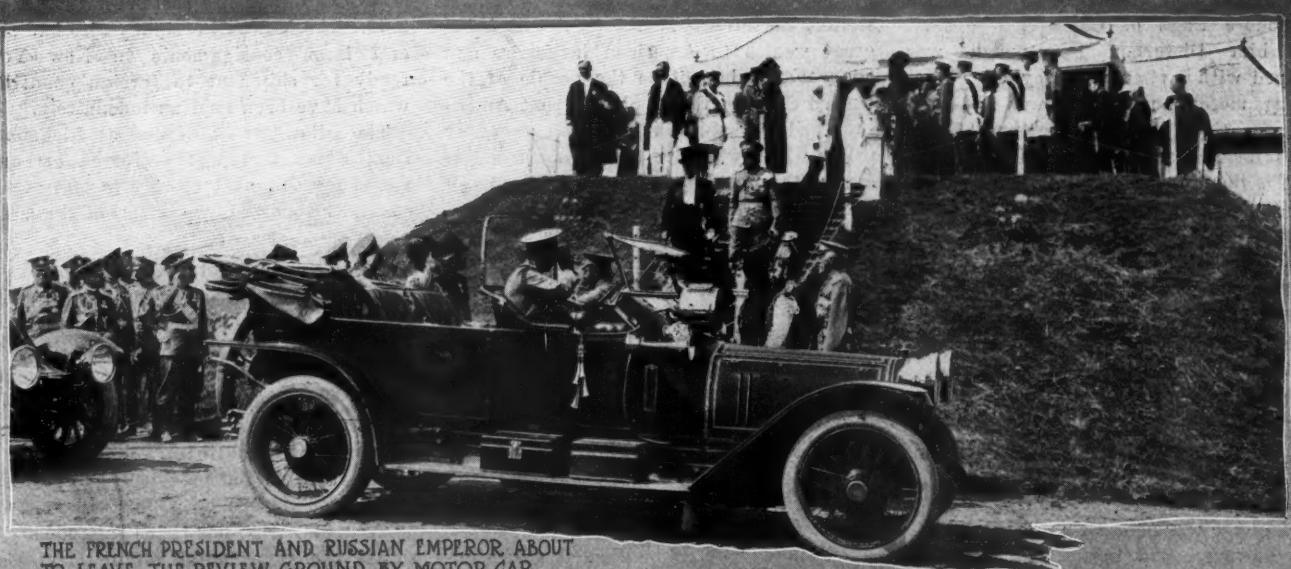
## English Factories Reported to Be Running to Fill War Orders for Cars

### Special Cablegram from J. S. Critchley

London, Aug. 11—Special cablegram—The position of the motor industry here is serious. All private sales are for the present dead and all programs for 1915 are at present in abeyance. Many pleasure cars are being bought for war purposes, which will keep some factories busy for the time being.

In view of the sea being open, it is anticipated the export trade will be maintained or even increased when permission to export cars can be obtained. Due to most of the continental factories being closed or working exclusively for governments, continental agents here are absolutely cut off from supplies from Belgium, France and Germany. All manufacturers will be compelled to rely on home materials. For example, the stock of Bosch magneto is very limited and all available supplies will be required for commercial vehicles.

The great demand for commercial vehicles for transport will keep this branch of the industry very busy, as large numbers, both new and second-hand, have been taken over, including some hundreds of London omnibuses. The withdrawal of horses also increases the demand for commercial vehicles. This branch will have a boom time, but the output may be retarded by lack of materials and restricted output of pleasure vehicles must prevail.



THE FRENCH PRESIDENT AND RUSSIAN EMPEROR ABOUT TO LEAVE THE REVIEW GROUND BY MOTOR CAR.

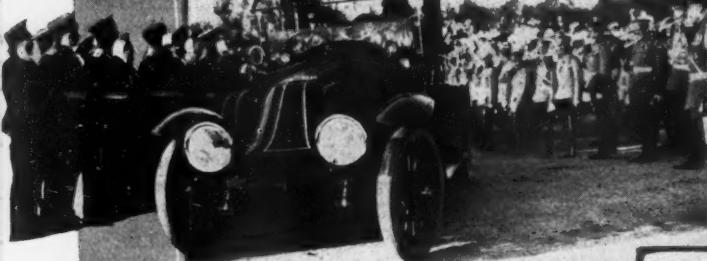
## French President Inspects Russian Army



RUSSIAN MILITARY MOTOR CARS ON THE REVIEW GROUND

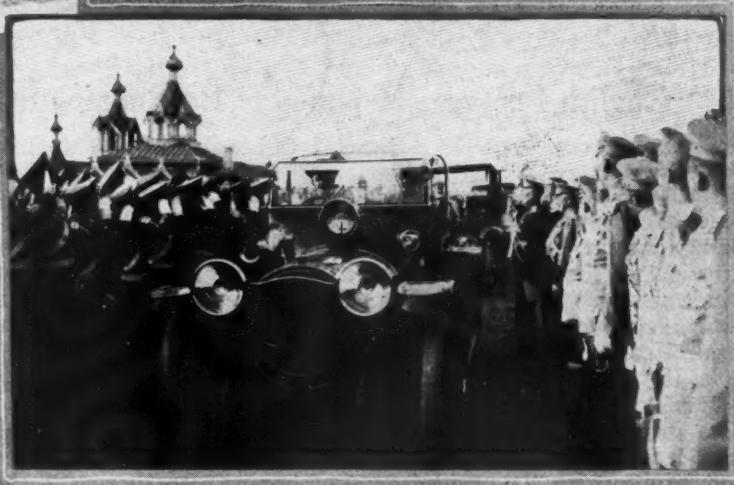


REVIEWING THE TROOPS FROM A MOTOR CAR



PASSING THROUGH THE LINE OF OFFICERS

**M**OST timely are the accompanying illustrations showing the review of the Russian troops by President Poincare of France, made just prior to the declaration of war that has involved the leading countries of Europe. The friendly relations existing between Russia and France are demonstrated through this visit on the part of M. Poincare. That Russia is a strong believer in the motor car is well illustrated by this series of illustrations.

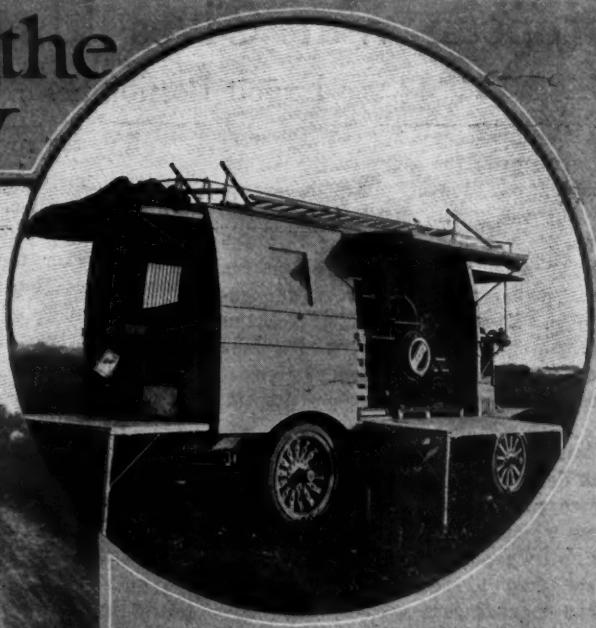


FRENCH PRESIDENT AND THE CZAR IN A DELAUNAY-BELLEVILLE

# Motorization of the French Army



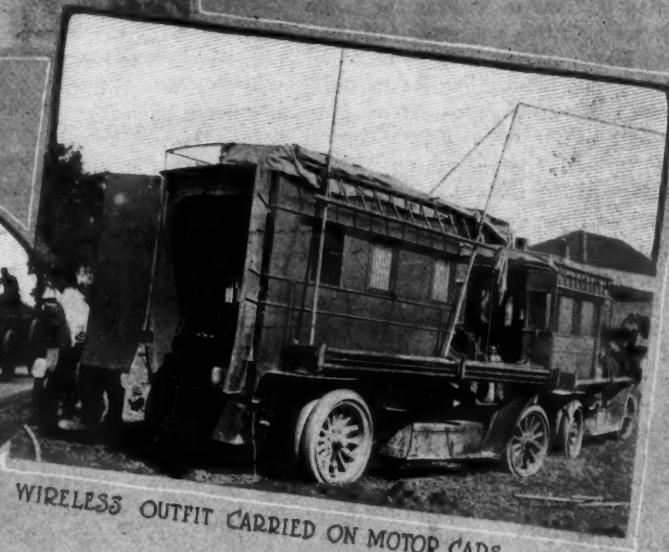
FAST TOURING CAR ACCOMPANYING TROOPS ON THE ROAD



THE MOTOR CAR WORK SHOP



PANHARD TRACTOR CARRYING NEW BIG GUNS



WIRELESS OUTFIT CARRIED ON MOTOR CARS



MOTOR BRIGADE IN AVIATION DIVISION

UNDoubtedly the French army is relying upon the motor car in the present emergency. Not only are passenger cars used for special work, but the army also utilizes trucks and tractors in transporting the troops. Among the motor equipment are traveling repair shops and motor vehicles for the transportation of aeroplanes.

# European War Gives U. S. Chance in South America

## Export Possibilities of Motor Industry Reviewed

WAR and rumors of war have upset temporarily the plans of the American motor car industry for its export trade, but the battle cloud which overshadows Europe has a silver lining for American commerce as a whole and for the American motor industry in particular. With sincerest sympathy for the stricken nations of Europe, America cannot close its eyes to the tremendous opportunities that are offered at the present time.

The stagnation of European production and the demoralization of European world commerce presents to the United States a chance which may never occur again of extending its export trade and of developing new foreign markets. For years American manufacturers have cast long-eyes toward the market possibilities of our sister republics in Latin-America, of the teeming millions in the far east and the progressive British possessions in Australia and South Africa. These markets have been wonderfully profitable to German, French and British exporters, but the desultory efforts of American manufacturers with a few exceptions have merely scratched the surface.

### War Leaves an Opening

Europe's embroil offers the opportunity of establishing the American motor car and its accessories as a staple of the world's commerce to an extent never anticipated before. Germany is isolated from the world, her merchant shipping is idle, her manufacturers are cut off from communication with their foreign agents, motor cars have been confiscated for war service, the employees of her factories have dropped their tools and shouldered the gun and such production as is going on in the factories will be absorbed by the army.

Almost similar conditions exist in France and Austria and Belgium. England is but little less crippled. The present disorganization of American water transportation, finance and maritime insurance is only temporary; the increased demand for American motor vehicles will be permanent. Financial and insurance difficulties already have almost readjusted themselves to the new conditions. Shipping stagnation can be relieved only by the establishment of an American merchant marine worthy of the name, and the present action of congress admitting to American registry ships of foreign build and removing the restriction that they must be manned by American officers will provide very shortly adequate means of commerce. The withdrawal of Germany's flag from the high seas will mean the restoration of America's. Not only will the profits from American sales in foreign countries be enormously increased, but money expended for transportation will stay in

By Darwin S. Hatch

America instead of going to Hamburg, Antwerp, Bremen, London, Liverpool, and Paris as it has heretofore.

Chances for the American motor car maker to develop territory which hitherto has been conceded almost wholly to European products present themselves through dual conditions of the withdrawal of these European products and the production of an American merchant marine. Even without the concentrated effort which can be made now, the American export trade has been growing year by year in a way that leaves its rivals far behind.

### France's Export Business

France has been in the lead in the matter of motor car exports ever since the motor vehicle became an article of commerce. For the year 1913 France exported \$44,000,000 worth of cars, one-third of the total value of the world's motor car export trade. The United States was second last year, selling \$35,000,000 worth of cars to foreign countries. This is just a little better than one-fourth of the total value of cars exported from all countries. Third comes Germany with \$20,000,000 worth of exports of cars and parts, which is about 15 per cent, then follows Great Britain with \$18,000,000, Italy with \$6,000,000, and Belgium with \$6,000,000.

Until the beginning of the war Germany's motor car exports were increasing at a more rapid rate than those of any other country, but that of the United States has been almost as great, both of them increasing 700 per cent during the last 5 years. England, during a like period quadrupled its exports, Belgium tripled them, France gained 80 per cent, and Italy only 20 per cent.

It is certain that exports from all of these countries, except the United States and perhaps Italy have come to a halt during hostilities and probably for many months after peace is declared. The countries which have been buying motor cars from outside sources are not to a great extent those embroiled in the present difficulty, so that it is up to America to supply the greater portion of the cars of the world's motor cars during the next year or two, and to take unto itself the \$135,000,000 that went into the coffers of motor car exporters last year.

This will mean that exports of motor cars from the United States will be trebled because two-thirds at least of the exports were from countries now engaged in conflict and from which not much production may be expected for at least a twelve-month. Government officials charged with the duty of advancing America's export trade assert that many markets now practically untouched can be made productive

if proper means are taken to exploit American cars. Of course Canada, as in the past, will continue to take a great proportion of them, chiefly because of its nearness to our producing centers, but also because conditions for which our cars are built are the same as conditions in the Dominion.

Though it has not been the case up to this time, American cars should be the best sellers in South America, South Africa, Australia and the Orient. This is because American road conditions are more nearly like those of the territories mentioned than are the road conditions in the European motor-producing countries. South America in particular should be the goal of the American motor car exporters' greatest effort, and it has only been through the lack of American shipping facilities and the rather desultory efforts of the most of the American manufacturers, as compared with the systematic and farsighted methods of European exporters, that the American car has not gained the chief foothold among our Latin-American neighbors.

During 1913, the whole of South America purchased but 105 commercial cars and fewer than 3,000 pleasure cars from the United States. The commercial cars are valued at \$215,000 and the pleasure cars at a little under \$3,000,000. Asia bought twenty-six commercial cars, valued at \$47,000, and 1,600 pleasure cars at a little over \$1,400,000. Oceania absorbed 36,000 cars, and Africa 14,000 cars. Motor car parts sold to South America were valued at \$275,000, to Asia \$105,000, to Oceania \$261,000, and \$65,000 worth of parts went to Africa.

### Business in Other Quarters

Possessions of the United States, not contiguous to it, such as the Philippines and other territories, it would seem should have offered an ideal field for exploitation by the American motor car manufacturer before this. The opportunity presents itself now. Last year a little over one-half million dollars' worth of cars and parts was shipped to non-contiguous territories of the United States by this country, and the field hardly has been scratched.

Aside from Canada, British Oceania is our best customer for motor cars, the official record showing that during 1913 Australia and Tasmania together took over 2,000 American cars valued at nearly \$2,000,000. New Zealand took just under a thousand, one of which was a commercial car, minor shipments were made to other parts of Oceania, together with more than \$2,000,000 worth of parts.

In South America, our best customer is Argentina, which in 1913 took 1,062 pleasure cars, valued at \$1,181,735, and thirty-five commercial cars, valued at \$78,000.

Shipments of parts, not including engines and tires, were valued at \$74,138.

Brazil is the second best customer in South America, that country taking last year from this country 987 pleasure cars, valued at \$1,035,247, and thirty-six commercial cars, valued at \$75,073 and parts to the value of \$108,859. Colombia followed with the importation of 110 pleasure cars, valued at \$113,334, together with three commercial cars, valued at \$6,112, and parts to the value of \$19,876.

Central American states are small buyers, Costa Rica, Guatema, Honduras, Panama and Salvador, buying only eighty cars in 1913.

#### Opening in South America

South America not only is ready for the American motor cars, but wants American motor cars as it wants other American goods, providing it can get them and can get the attention and service to which it has been accustomed from European manufacturers, who have made the South American markets a life study and who have profited enormously thereby. The success of the American motor car in the export trade depends upon the highest grade of service, and South America has offered itself voluntarily to American exports. F. C. Enright, the Buenos Aires representative of the Chamber of Commerce of the United States, has cabled to America urging that American manufacturers send samples of their products at once. In the case of motor cars, samples means demonstrators. You cannot sell the South American a motor car from a catalog.

"American manufacturers, particularly American motor car manufacturers, have overlooked the opportunities that have been offered heretofore toward extending their trade in South America," says a motor tradesman familiar with the situation. "The domestic demand for American cars has been so great that the export trade has been neglected. When branches were established in foreign countries and local connections made, it was too often the case that shipments were held back, and even uncrated at the wharf to supply a sudden rush of domestic orders. Such policies have seriously retarded the growth of this foreign trade."

"Another thing which has given the American motor car manufacturers, though not the American car, a black eye in the foreign market is the habit which it is reported one or two manufacturers have had of shipping their foreign agents a last year's model car as one of this year's vintage.

"It is not believed that such attempts at questionable methods have occurred recently, but there have been current reports among the foreign trade in the past. Manufacturers who wish to trade with South America or other foreign markets must study the market and render service to the best of their ability, or the opportunities now offered will turn to other

channels as they often have done before."

In the matter of representation, particularly in South America, too much weight has been given to the language, and not enough to salesmanship. Though previous knowledge of the tongue is an important asset in the foreign trade, a more important one is experienced sales ability. Too many times some inexperienced youngster who had no other qualification than his knowledge of the language has been commissioned to sell cars in some South American country with results decidedly disappointing to the manufacturer. The value of knowledge of the tongue must not be underrated, but it is not the only necessity.

Spanish is spoken in all South American countries except Brazil, where Portuguese is the native language. In discussing sales opportunities in Latin-America a representative of the Pan-American union, who has just returned from a tour of these countries, stated that Argentina, Brazil and Chile present the most fertile field for exploitation. He stated that manufacturers and jobbers of the United States should proceed to get this trade in just the same way as they would proceed to get business in Texas. He stated that it was his belief that American selling methods, the methods used in the United States, are the best and most efficient in the world and the American salesmen can beat the German, English and French salesmen without half trying. But in order to corral the South American trade, the best

American salesmanship must be used. It is a great help to the salesman if he has the knowledge of the country. This representative stated that too many American firms have picked up young Spanish-Americans without any technical knowledge of salesmanship and have sent them to Buenos Aires or Rio de Janeiro to sell their goods, and have been disappointed in results.

#### A Billion-Dollar Market

South America is a billion-dollar market and the United States only has 15 per cent of the trade. Now is the opportunity to get into that market, in the everlasting gratitude of the South Americans and build up a permanent export trade.

In the awakening of the orient the American car manufacturer finds an opportunity to develop a trade that until this time has been in too great a measure a European monopoly. Just to show what a ripe field is awaiting American motor car manufacturers, the following quotation from a report sent by Consul General Sammons, at Shanghai, China, is interesting:

"The interest in motoring, among both the native and foreign populations, is steadily increasing in Shanghai and other parts of China. The increase in the importation of American cars continues. As far as can be ascertained the total net importation of motor cars for China during 1913 amounted to \$359,862, being an increase of \$180,676 over the previous year."

## Carl G. Fisher Returns from Europe

### Hoosier Tells of War Adventures

INDIANAPOLIS, IND., Aug. 11.—Carl G. Fisher, president of the Indianapolis motor speedway and of the Prest-O-Lite company, reached home this morning, accompanied by Mrs. Fisher and Johnny Aitken of the National company, having escaped from the European war net. The party came back on the White Star liner, Laurantie, an English ship, which landed at Montreal Sunday.

"We were just 6 hours ahead of the war net," says Mr. Fisher. "We had some trouble getting away but it pales into insignificance when compared with the difficulties others are having. There must be at least 100,000 Americans trying to get home."

"We were at Le Mans when the war cloud broke, prepared to watch the running of the little grand prix. We lost no time in hurrying to England, whence we sailed on the Laurantie.

"It looks as if the war would last for some time. In England they are not confiscating motor cars, but I understand they are in Germany and several other countries. The war is demonstrating to everyone just how valuable the motor car is; in fact, it is invaluable. The various governments find it particularly adaptable to

transporting troops. They can load fifty soldiers in one motor truck and move them faster than they can by freight train.

"The foreign motor car factories will not be shut down for the reason that their products are needed for war purposes. But the factories are greatly handicapped by so many of the workmen being reservists. Boillot is aid de camp and driver for the generalissimo of the French army; Goux is a mine layer in the army, while Thomas, winner of the last 500-mile race is an aviator in the French army. Boillot also is a reserve aviator.

"As to what effect this will have on the next 500-mile race, it is hard to say. However, I look for the war to be over by that time. There will be enough of the foreign cars to insure European representation, while I look for more American cars than ever."

#### DETROITER RUMOR DENIED

Detroit, Mich., Aug. 10—During the last few days it has been rumored that there would be a complete reorganization of the Briggs-Detroiter Co. This is denied by President C. S. Briggs, who says: "Nothing of the sort is contemplated."

# Utilizing the Hill Sides for Private Garages

## Some Examples of California Architecture



GARAGE BUILT OF COBBLESTONES AND BLENDED INTO ITS TERRACING SCHEME

**M**OTOR cars have become so popular, so common, that comparatively few city residences today are built without some provision being made for their housing. Sometimes the garage may not be actually built at the time the house is constructed, but a possible location, with a driveway leading thereto invariably is planned, to meet a future demand.

### The Hillside Garage

Of course, where the building lot is level, or comparatively so, the planning of the private garage is a simple matter, the principal requirement, to comply with good architectural taste, being that it correspond in style, at least to some extent, with the residence itself. Where the lot lies on a hillside, however, the matter becomes more of a problem—or, at least, such is the general impression. The lot may rise from the street so abruptly that it is quite impossible to construct a practical driveway to reach a garage in the rear, the usual garage location, or the lot may slope off at the back to such an extent as to create an almost equally difficult problem.

**By Charles Alma Byers**

Accompanying this article are illustrations showing several private garages in Los Angeles which solve this problem in a most admirable manner. In fact, these garages are so attractively designed that it becomes somewhat of a question whether the hillside lot is not to be preferred rather than shunned for building purposes by the motor car owner.

One of the illustrations shows a particularly attractive garage built of cobblestones. It is located on the front of the lot, on a level with the street, and the driveway leading into it is of white cement, like the steps which lead up from it to the entrance of the residence. Cobblestones also are used in the terracing walls of the grounds, as well as for the masonry work of the house. The design of the garage, with its white cobblestone walls, is especially effective, and is made to blend into the terracing walls in a most admirable manner. The use of vines helps to give added charm to the arrangement.

In another illustration a garage is shown that virtually is a part of the house itself, constituting a sort of basement. Here the driveway, leading in on a level with the street also, is covered by a pergola, with uprights and crosspieces of rough-sawed redwood. The low walls on each side are of brick, and the flooring is of cement. The grounds are terraced, and all walls, and the lower part of the house itself, are of red brick. The garage, large enough to house two machines, is almost concealed from view, and the whole arrangement is very artistic. Steps rise from the rear end of the pergola, making the garage very convenient of access from the front of the house.

### Concrete Often Used

A garage built of concrete also is illustrated. In this case no driveway is necessary, the entrance to the garage being directly from the street. The residence is situated on an embankment about 10 feet above the street, and the space for the garage is created by tunneling into this embankment. The concrete retaining wall forms the front wall of the garage,

and the other walls are also of concrete, while the flooring is of cement. Cement steps rise from the sidewalk to the elevation of the house. This is a particularly adaptable suggestion for locations of this kind.

The remaining illustration shows a garage located against an embankment in the rear end of the lot. The driveway makes a gradual descent from the street of about 5 feet, forming a right angle turn in front of the garage so as to reach the entrance, which faces one side of the lot. The garage in this case is of frame construction, with shingled exterior walls, and cement flooring. On top of the garage is constructed a large summer-house, the floor of which is only about 2 feet above the level of the back yard. The summer-house has a shingled roof, and is open on all four sides. It is furnished with a table and chairs, and is reached by a few steps rising from the garden. An arrangement of this kind serves a twofold purpose, besides solving the embankment problem.

The foregoing descriptions should confront a problem of this kind. The garages are attractive and are conveniently located. More than that, they illustrate the use of different kinds of great many possibilities to garage builders building materials.

#### BADGER ROAD LAW IN DANGER

Milwaukee, Wis., Aug. 10—There is grave danger that Wisconsin's model highway law, which provides unusually liberal state aid for permanent improvement of highways, may be repealed at the 1915 session of the legislature because of the general uproar over high taxes throughout the state. The campaign for governor, state officers and legislative positions now is at fever heat, and "lower taxes" is the popular cry of candidates, who have hit upon the seemingly large expenditure of state funds as highway aid as being a main cause of high taxes.

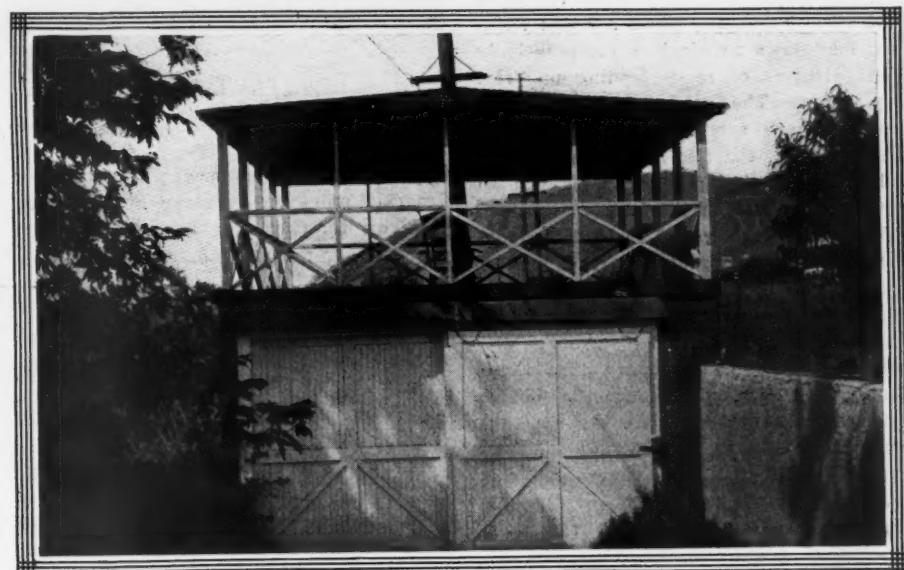
Wisconsin's contribution to highway work this year is about \$4,250,000, and the fact that the state has in past years spent very small sums for highway purposes makes the \$4,250,000 loom up large and nearly overshadows the great benefit the expenditure is bringing to the state and its people.

Under the present law, the state highway commission controls all highway construction which receives state aid, with the result that continuous roads are being built rather than short stretches here and there, without connection. The township pays a third, the county a third and the state a third of the cost of these roads and the total is distributed among local, county and state taxes in such a manner that the individual taxpayer is not burdened.

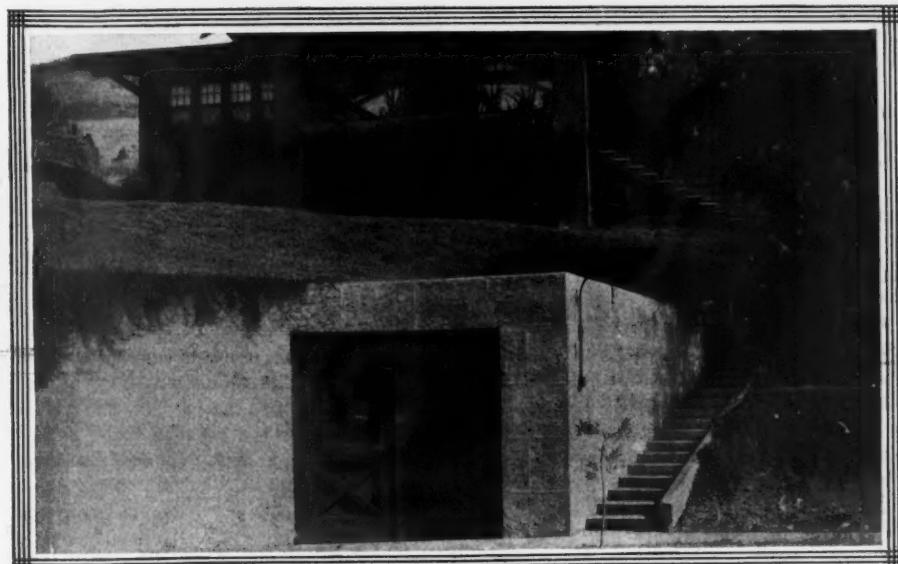
Resolutions are being adopted by many associations of all kinds protesting against the proposed repeal of the law by the Wisconsin legislature.



DOUBLE GARAGE THAT FORMS A SORT OF BASEMENT TO THE HOUSE, REACHED BY DRIVEWAY COVERED WITH PERGOLA



A GARAGE BUILT AGAINST AN EMBANKMENT AT REAR END OF LOT, WITH SUMMER HOUSE AT THE TOP



GARAGE BUILT OF CONCRETE AND TUNNELED INTO FRONT EMBANKMENT

# Motor Car Stimulates Hiking on the Pacific Coast

Walkers at Santa Barbara Use It to Get to Mountains

THE last 6 months has seen a great revival in mountain hiking in Santa Barbara, Calif., entirely due to the motor car. At first thought this may appear a bit strange, but it does not take a long second thought to appreciate what this method of locomotion has meant in the development of a sport as it relates entirely to the mountains.

To the north of Santa Barbara, stretching east to west, is the Santa Ynez range of mountains, with an average elevation of 3,500 feet. This range is part of the Santa Barbara national forest and during the last 16 years the forest rangers have constructed a splendid system of trails up the various canyons with connecting laterals. Within a radius of not to exceed 10 miles from the business section of the city there are not less than 100 miles of trails. There are about a dozen trails that lead down to within a comparatively short distance of roads leading up from the valley. The grades to the foot of these canyons are in all instances very easy; in fact, the rise always is so gradual that any motor car can be run to within half a mile of the foot of any trail.

These trails are from 5 to 10 miles from the city, over comparatively level land, a long and uninteresting walk to a person who is seeking the mountains.

#### The Hikers Organize

It was early last January that three young men, walking along the beach, chanced to converse about the splendid mountain trails that constitute such an unusual asset, and the suggestion was made to organize the Hikers.

During this first discussion the main problem of getting to the trails was solved. There are several motor trucks in Santa Barbara, and previous to this time they had been used for taking parties to Sunday barbecues and the like. The suggestion needed no further discussion and on that same day it was decided to issue a call to those who might be interested and a dozen men were on hand the next Sunday morning, and in half an hour a large motor car had deposited the party at the bottom of the Cold Springs trail and later in the afternoon called for them in the Hot Springs canyon, the one just east. They had walked 15 miles, climbing nearly 4,000 feet.

Without the motor car such a day's sport could not be enjoyed. The distance from the city to the Cold Springs canyon, one of the nearest, is 5 miles, much of it through improved lands and offering nothing of special interest to the regular resident here. But by employing a motor car that tedious distance is all left behind in 30 minutes and the hikers are fresh for the trail. As the Hikers walk from 12 to 18 miles on such a day's outing, it can be



LOOKING BACK AT CIVILIZATION

appreciated what it means to obliterate from 10 miles up by using a motor car. The cost for each person does not exceed 50 cents for the going and returning trip, as the owner has the greater part of the day to himself in the city.

When this system was first spoken, some of the others in town were inclined to scoff at the idea of riding at all.

"You're a great bunch of hikers, to ride most of the way," was a comment.

It was quite thoughtless and meaningless.

The Hikers have been out quite regularly on alternate Sundays. The usual hour for the start has been 8:30, which means that they are at the trail at 9 o'clock or thereabouts. During the last few months women have been admitted to membership and some of them are just as hardy as the men. The equipment for a day consists of knapsack, containing lunch, and a canteen. The majority also carry cameras, and the taking of pictures is one of the real delights with many, as varied and wonderful are the views.

#### Canteen a Necessity

The greatest necessity in the mountains is the canteen. A person may go a long time in the mountains and not suffer from hunger, but once thirst commences to make its demands it never ceases until appeased. Water is an uncertainty in the mountains, and for that reason the safest thing is to have the canteen filled before the start, unless there should be some known waterhole along the way. But many a party out has come to grief by accepting the assurance that at such and such a place up in the mountain would a spring be found. There might have been

one there a couple of months ago, but on a July or August day it would be dried up. Therefore, the canteen may be considered the hiker's best friend, and if the outside is well wetted the water will remain cool a long time.

#### Mountain Distances Deceptive

The average distance from the bottom of a canyon up the trail to the top is 6 miles along the range at Santa Barbara. Mountain distances, as viewed from afar always have proved deceptive to the uninitiated, and the bigger the country the more deceptive they are. As one looks at the range from Santa Barbara one hardly would believe the distance up to the top would be that great. But the trails must follow the line of least resistance, and that often accumulates into quite a distance, but replete with great views, nearer glimpses of the canyon, or the farther of valley, sea and channel isles, always varying with the different altitudes.

H. G. Brookings, a retired capitalist of St. Louis, spends the greater part of each year in Santa Barbara because of this great system of trails and he has been instrumental in the construction of many. He divides a couple of months between his country home near Oconomowoc, Wis., Old Point Comfort and Atlantic City, but then is back in Santa Barbara to enjoy the trails. Mr. Brookings, however, covers them on horseback.

"I came to Santa Barbara first in 1883," said Mr. Brookings to the writer on one occasion when they were exchanging dope on the trails. "After that I spent 14 years roaming about the world to see if I could find anything to equal it. I visited all lands and famous resorts. At

the end of 14 years I sat down and took an accounting and concluded that for mountain, sea and climate Santa Barbara had a combination that could not be equalled anywhere in the world. So I have been spending the greater part of the last 16 years in Santa Barbara."

When Mr. Brookings first came there was only the Cold Springs trail, leading over to a quicksilver property, long since abandoned. He considers the view from the top of that trail as one of the greatest in the world. There may be others that are grander in their individual qualities, but this one has a rare combination.

Mr. Brookings frequently tells the story of meeting a man at the Arlington hotel about 14 years ago, who suggested getting up a party to ride up the Cold Springs canyon. It was arranged, and a little as if the remedy is worse than the disease after noon the top was attained. They lingered long and finally Mr. Brookings felt compelled to suggest it was time to start down if the city should be reached before dark.

"Give me just 5 minutes more," said the stranger. "I have come a thousand miles out of my way for this and this is the third time I have stood here. I have traveled around the world in three different directions and believe I have enjoyed its greatest views. But to my opinion, this view from the top of the Cold Springs trail is the greatest of all. Look off there to the south—a spreading valley, then a city, sea and the distant channel islands. We stand at the edge of a civilization. Then turn around and look to the north and you have an unfinished world, range upon range of broken country, farther than the eye can see."

And any one who has stood at that spot can fully appreciate the enthusiasm of the stranger. A camera can do but meager justice to it.

## Answers to Inquiries for Motor Routes

### Peoria, Ill.-St. Petersburg, Fla.

ELMWOOD, Ill.—Editor Motor Age—Please advise the best route to St. Petersburg: also road conditions. I expect to make the trip about October 15.—Reader.

Your road lies toward Indianapolis about 223 miles, passing through Mackinaw, Danvers, Bloomington, Le Roy, Farmer City, Champaign, Urbana, Danville, Covington, Crawfordsville, Jamestown.

Directions as given to the inquirer from Fort Dodge may be followed as far as Live Oak, Fla., from which point you continue on south through Branford, High Springs, Gainesville, Ocala, Hernando, Inverness, Brooksville, Tampa and around the bay by way of Tarpon Springs and Belleair to St. Petersburg.

In looking for running directions for your trip you should secure Blue Books 4 and 3, each selling at \$2.50 and published by the Automobile Blue Book Publishing Co., Chicago.

### Texarkana, Tex.-Palestine, Tex.

Texarkana, Tex.—Editor Motor Age—What is the most practical route to Palestine, Tex.? —J. E. Hutchison.

Your routing lies west to Dallas, 219 miles through New Boston, DeKalb, Annona, Clarksville, Detroit, Blossom, Paris, Petty, Honey Grove, Bonham, Ely, Whitewright, Vaddalia, Anna, Melissa, McKinney, Richardson and Padgett. It is 111 miles to Teague via Lancaster, Waxahachie, Corsicana, Wortham, and Mexia being macadam the first 50 miles and then dirt with some sand from there on. You will be obliged to inquire your way from Teague to Palestine.

### Gate City, Va.-Asheville, N. C.

Gate City, Va.—Editor Motor Age—Please give the route and distance to Asheville, N. C. I would like to return a different way. I know the road to Kinsport, Tenn.—A. McG. Wallace.

The only road over which you can find running directions is the following published in the Blue Book 3, which can be secured from the Automobile Blue Book Publishing Co., 2160 Broadway, New York, for \$2.50.

From Kingsport go through Rogersville and Russellville to Morristown and New Market then head south over mostly sand-clay roads with some stretches of pike and macadam 124 miles through Jefferson City, Dandridge, Oak

Grove, Reedtown, Wilsonville, Newport, Cosby, Mt. Sterling, N. C., Summit, Cove Creek, Waynesville, Clyde, Canton, Turnpike, Candler, and W. Asheville.

To return a different road you will find one running through Marshall, Paint Rock to Newport taking up the same road as on your going trip and following it back to Russellville, then you can continue on up to Bristol with running directions through Greeneville, Jonesboro, Johnson City, Elizabethton, Childers, and Bluff City. Bristol back to Kingsport is Blountsville.

### Newton, Ia.-Winston-Salem, N. C.

Newton, Ia.—Editor Motor Age—Please give the route to Winston-Salem, N. C.—E. J. M.

Travel to Clinton, which is 183 miles from Newton, routing through Kellogg, Grinnell, Brooklyn, Victor, Marengo, Amana, Cedar Rapids, Marion, Mt. Vernon, Mechanicsville, Clarence, Lowden, Wheatland, Grand Mound, De Witt and Elvira.

Across Illinois to Chicago the regular road followed leads through Fulton, Morrison, Sterling, Dixon, Franklin Grove, Ashton, Rochelle, Creston, DeKalb, Geneva, Lombard, Maywood, and Garfield Park, and is 148 miles.

The Chicago-South Bend road of 100 miles is Kensington, Riverdale, Thornton, Highlands, Hobart, Wheeler, Valparaiso, LaPorte, and New Carlisle, then to reach Cleveland a distance of 283 miles is covered, passing through Mishawaka, Osceola, Goshen, Ligonier, Wawaka, Kendallville, Waterloo, Butler, Edgerton, Bryan, Archbold, Napoleon, Liberty Center, Bowling Green, Pemberville, Woodville, Fremont, Clyde, Bellevue, Monroeville, Norwalk, Townsend, Kipton, Oberlin, Elyria, and Dover.

Cleveland to Pittsburgh, 140 miles, passes through Bedford, Hudson, Darroville, Stow Corners, Kent, Ravenna, Edinburgh, Jackson, Austintown, Youngstown, New Middleton, Darlington, Pa., Beaver Falls, New Brighton, Rochester, Freedom, Economy, Sewickley, and Glenfield.

The road to Bedford, 97 miles, is indeed easy to follow, going through Winkinsburg, E. McKeesport, Adamsburg, Greensburg, Ligonier, Stoyestown and Schellburg, Bedford to Hagerstown is 68 miles via Everett, Breezewood, Harrisonville, McConnellsburg, Foltz, Mercerburg, Upton, Greencastle, to Staunton, 133 miles, via Williamsport, Martinsburg, Clarksville, Bunker Hill, Winchester, Kernstown, Stephens City, Middletown, Strasburg, Toms Brook, Woodstock, Mount Jackson, New Market, Lacey Springs, Mount Crawford, Burkstown, Mount Sidney, to Roanoke, 89 miles, via Mint Springs, Greenville, Midway, Fairfield, Lexington, Fancy Hill, Natural Bridge, Buchanan, Troutville, Cloverdale, to Winston-Salem, 124 miles, via Rocky Mount, Snydersville, Martinsville, Ridgeway, Stoneville, Madison, Ellisboro, Stokesdale and Kermersville.

### Cincinnati, O.-Peru, Ind.

Peru, Ind.—Editor Motor Age—Kindly publish the route from Cincinnati to Mammoth Cave.—H. B. Fox.

The best route takes you first to Louisville, 136 miles, over a good stone and gravel road with most interesting views passing through Mack, Cleves, Homestead, Lawrenceburg, Aurora, Oberdean, Markland, Vevey, Carrollton, New Castle, Shelbyville, and St. Mathews.

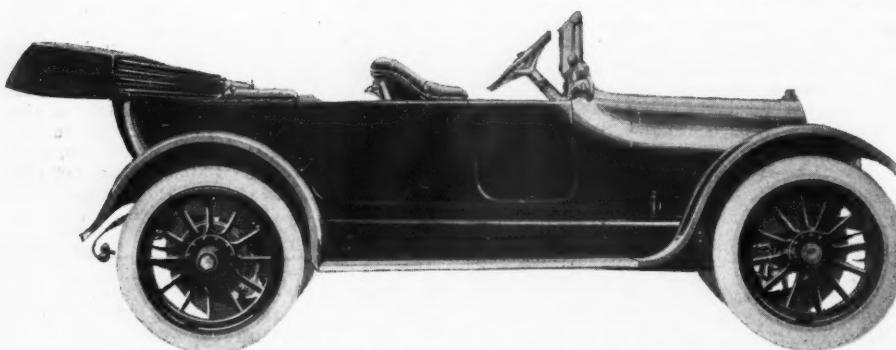
Louisville to Mammoth Cave is 113 miles running through Benkel, Mt. Washington, Smithville, High Grove, Cox Creek, Bardstown, New Haven, Buffalo, Hardyville, Bear Wallow, and Cave City.



THE HIKERS READY FOR THE DAY'S WALK

# Overland Adopts Left Drive and Center Control for 1915

Model 80 Has Stream Lines and Electric Lighting



NEW OVERLAND MODEL 80 TOURING CAR SHOWING BODY LINES

LEFT drive, centralization of control and streamlike bodies are the distinguishing features of the new Overland cars for the 1915 season. These are known as the model 80 and are a continuation, with minor refinements, of the model 79 of the 1914 series. In elementary features and all important dimensions, the new car remains the same as its immediate predecessors, but it has been refined throughout to give a more up-to-date appearance and a design of larger and roomier proportions, so far as the body is concerned.

This is the first time that the steering wheel has been mounted at the left on Overland cars. Little change has been made in the chassis in shifting from the right to the left side; in fact, the bending of the exhaust manifold closer to the cylinders of the engine is the only alteration necessitated in the motor by the new location of the steering wheel. Tires have been increased from 33 by 4 to 34 by 4.

#### Electric Cranking Stock

In the matter of price, the latter remains the same as it was for 1914, when the electric lighting and cranking system was added. This year, electric lighting and cranking is stock equipment, and the price is \$1,075 for the five-passenger touring car, \$1,050 for the roadster, and the coupe at \$1,600. Tires on the latter are 35 by 4½ non-skid.

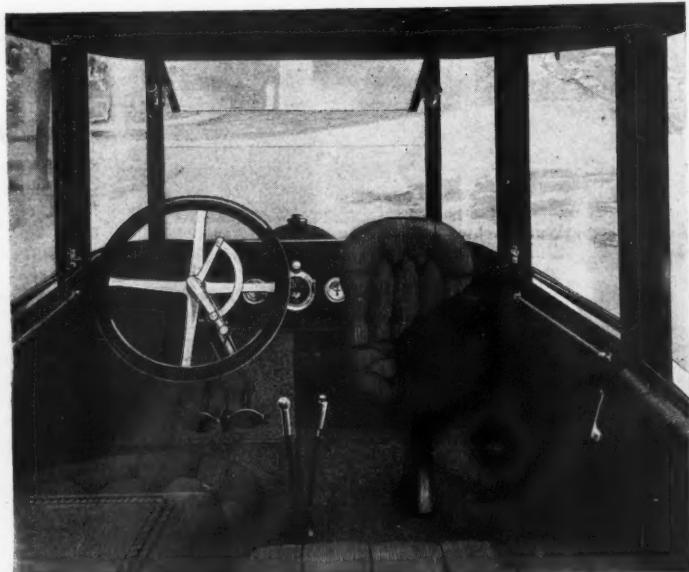
Chassis arrangement remains practically the same as it was on the model 79. The motor has not been altered, with the exception of a small improvement in the oiling system, which has been done to insure that all cylinders secure an equal amount of oil when ascending a steep grade. The change provided to accomplish this result is the moving of the oil feed to the forward end of the crankcase. Reciprocating parts have been lightened

OVERLAND TWO-PASSENGER ROADSTER MODEL 80, ILLUSTRATING NEW TYPE OF WINDSHIELD

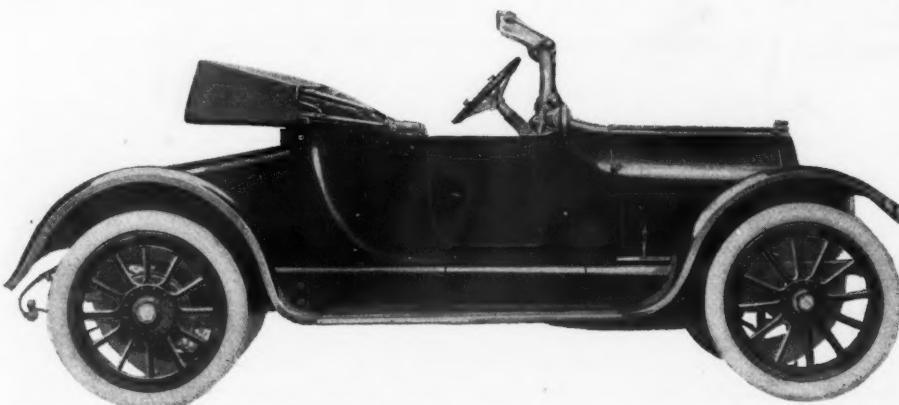
by making the webs in the pistons thinner than formerly, and the piston rings are now balanced by having drilled holes which allow the gases to get behind the ring, thereby eliminating pinking when the motor is laboring. For easier assembly and to do away with metallic sounds, a union joint has been placed in the exhaust pipe just back of the motor.

#### FEATURES OF NEW OVERLAND

Price remains at \$1,075  
Drive changed to left side  
Electric cranking and lighting stock equipment  
Center control  
Lights, ignition and horn controlled from board on steering column  
Tires increased to 34 by 4  
Ignition by Bosch magneto  
Oiling system improved  
Streamline bodies with clean running boards  
Muffler cutout added



INTERIOR OF OVERLAND SEDAN SHOWING SEATING ARRANGEMENT



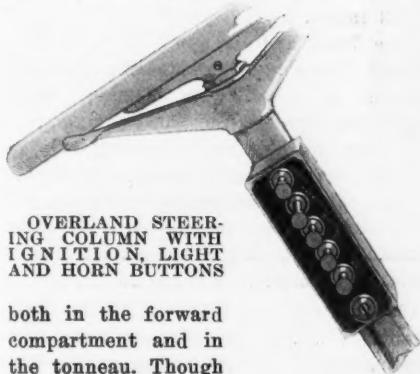
wheel. Through this keyboard the electric horn, lights and ignition are controlled without the effort of stooping forward to the instrument board. The starter button also is on this keyboard and must be pressed before the starter pedal. This arrangement has been made so that it is not possible for the driver to throw in the starter by accidentally stepping on the

starter button. The pressing of the button on the steering column operates a solenoid which unlocks the sliding gear, the current is connected up when the armature shaft sliding gear meshes with the teeth of the flywheel gear.

There is a muffler cut-out on this model which can be operated by kicking a small lever ahead. The accelerator is of a different design and a side rest is provided to eliminate strain on the foot when driving for a long distance. The pedals on the coupe model are now adjustable.

A new sight feed will be found in the layout of dash instruments. This is an ingenious device which has a small vertical wheel operated by the oil passing through the sight feed. When the oil clogs the feed so that the ordinary sight feed would not be visible, with this device it is still possible to see the revolving wheel and thereby follow the oil flow.

Bodies have been enlarged greatly and provide an exceptional amount of space



OVERLAND STEERING COLUMN WITH IGNITION, LIGHT AND HORN BUTTONS

both in the forward compartment and in the tonneau. Though the wheelbase remains at 114 inches, the space has been utilized better and larger seats and many other features of comfort included. The rear seat, for instance, is now 49 inches wide inside. The front seat is 40 inches wide and the backs are 19½ inches high in the rear and 18 inches in the front.

The seats are 20 inches deep in the rear with cushions which slope toward the rear.

There is a new top which has its storm curtains stored in a metal box directly behind the front seat, rendering it possible to put these curtains up without disturbing the passengers in the tonneau. Instead of the leather straps which ordinarily hold the folded-down top, the new Overland has a unique clamp which holds the top back securely and at the same time prevents all rattling. Leather pockets are now provided in all the doors and in addition these doors are hung on concealed hinges with inside-operated latches placed so as to make it impossible to catch in the clothes of a passenger leaving the car.

There now is a division in the front

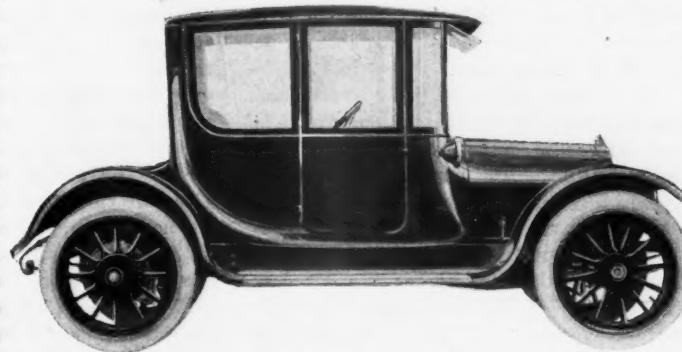
seat between the driver and the front passenger, whereas in the model 79 the front seat was all in one. The windshield now is built directly on the top of the cowl and provides rain-vision and ventilating facilities at the same time being waterproof. The fittings on this windshield are neater and smaller than on the previous design. The brackets for the windshield are of the folding type and are vertical in place of the sloping brackets used before.

These changes are in line with the development of the streamline form of car used this season. The radiator is molded into the body curve and the engine hood slopes gradually to the new form of cowl dash. The body line then sweeps without abruptness to the full curved tonneau back, giving a well rounded design, which follows the modern trend in bodies without offering anything of a radical departure from standard practice.

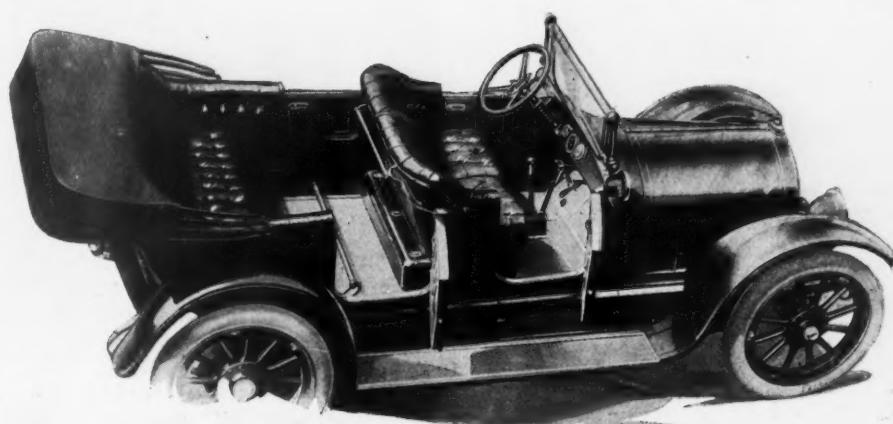
Overland floating rear axle is continued and the brakes are unchanged, but a new design of front axle is employed, which, together with the body frame, brings the body 3½ inches closer to the ground. The rear springs now are underslung and both front and rear are the same shape as in the model 79. The rear springs are longer than they were, being now 48 by 2 inches, whereas they were formerly 42 by 1.75 inches.

#### Body Lower Hung

On the model 80 the frame has been given a drop of 3.25 inches. It is of heavier material, having a channel section  $\frac{1}{2}$  x



EXTERIOR OF NEW OVERLAND COUPE



INTERIOR OF THE TOURING CAR, ILLUSTRATING THE LEFT DRIVE AND CENTER CONTROL AND THE CARRIER FOR THE CURTAINS BEHIND FRONT SEAT

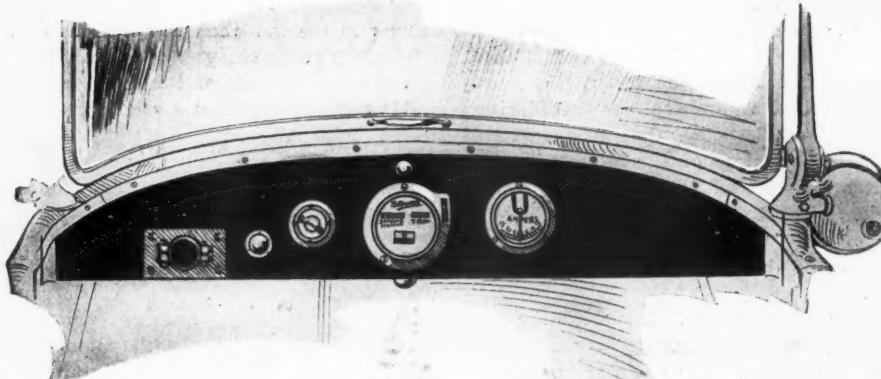
inch deeper,  $\frac{1}{4}$  inch wider and 1/64 inch thinner in the web than the previous one.

Starting and lighting system has been redesigned in many particulars. In the previous model the starter shaft was connected with the crankshaft by silent chain; it now meshes directly with gear teeth on the flywheel. With the new starting system the Overland engineers claim that the motor can be cranked under ordinary circumstances at from 190 to 200 revolutions per minute. The electric generator, which is a separate unit, is mounted on the left side of the motor and is driven by silent chain. The features of this system will be described later.

#### Power Plant in Detail

The Overland power plant has its four cylinders cast singly and set  $\frac{1}{8}$  inch off center. The cylinders are L-head, carrying the valves and manifold on the left side of the motor. The bore is 4½ and the stroke 4½, developing, according to the Overland engineers, 35 horsepower on the brake at normal speed. The pistons have two rings, each of which is a double design providing compression and lightness in small space. There are two oil grooves below the wrist pin which is held solidly in the piston boss and is of hollow design. The wrist pin bearing is lined with bronze. Connecting rods are I-beam section and are connected to the crankshaft at the crank bearing by two bolts. The crankshaft is a carbon steel forging having five main bearings. Cams are integral with the camshaft and act directly on the flat push rods. Tappets are held in long guides which are designed to prevent oil from leaking past the bushings. The valve springs are held in cup-shaped disks and the valves also are provided with bushings at the point where they enter the cylinder. The spark plugs are placed directly over the intake valves and priming cups are placed over the exhaust valves. Valve diameter, 1.625 inches; intake lift,  $\frac{1}{2}$ ; exhaust,  $\frac{1}{2}$ .

Cooling is accomplished by a thermosyphon system and the water jackets, together with the water intakes and outlets, have been kept large with a minimum amount of curvature to meet the require-



INSTRUMENT BOARD OF OVERLAND MODEL 80

ments of this system. Cooling is further aided by a six-blade fan driven by a belt. The fan bracket is bolted to the crankcase. A change has been made here for next season in that the fan now runs on ball bearings in place of the plain bearings used in model 79.

Lubrication of the motor is secured by the constant-level splash system, in which the oil is circulated by a pump. The oil reservoir is in the bottom half of the crankcase and from this point the oil is taken by a gear pump and forced through the new sight feed on the dash. The oil lead runs along the length of the crankcase and keeps the splash troughs constantly full. The scoops on the bottoms of the connecting rods keep the bottom of the motor filled with a thick oil mist.

#### New Ignition System

Current for ignition is supplied by the Bosch magneto mounted on a bracket at the right front end of the motor. The drive is through a leather coupling and the leads are carried in fiber blocks which are held on the water intake and exhaust pipes. At the speed at which the motor cranks the engine, there is no need of an auxiliary system for starting and hence the Bosch single ignition has been adopted. The generator which supplies the current for the storage battery is mounted on the left side of the motor at the front end and is driven by silent chain off the crankshaft. The generator cuts in a car speed of 7 miles an hour and reaches its maximum output of 14 amperes at 18 miles per hour. Regulation of the current is effected by a compound shunt winding in the armature of the generator. The cranking motor is series wound, operating at 6 volts through a gear which meshes directly with the flywheel.

Gasoline feed is by gravity. On the touring cars the capacity of tanks is 15 gallons and on the roadster 30 gallons. The carburetor is the latest design of Schebler model R, provided with a double-heated air intake which takes care of both

the primary and auxiliary air supplies. The carburetor primer has been moved from the steering column to the cowl board and by its use a rich mixture can be provided for starting. No gradient which can ordinarily be met with can affect the flow of gasoline to the carburetor as it is hung exceptionally low on Overland cars. The straight part of the intake manifold extends vertically upward to some distance before it branches out in the balanced Y in passing to the cylinder ports.

The clutch is a leather-faced cone provided with a brake to aid in gear shifting. This design has not been changed in any particular. The gearbox, while the same in nearly every particular, now has a different set of gear ratios and the countershaft has been made adjustable by the addition of two adjustment screws, one at either end. The gear ratios are now: first,  $11\frac{1}{2}$  to 1; second,  $6\frac{1}{2}$  to 1; third,  $3\frac{1}{2}$  to 1; reverse,  $14\frac{1}{2}$  to 1.

#### Overland Transmission

With these ratios, at 1,000 revolutions per minute of the motor, the car would be traveling 8.85 miles per hour on first speed; 14.65 miles per hour on second speed; 27.0 miles per hour on third speed and on reverse 6.86 miles per hour.

As in the past, the Overland gearbox is mounted at the rear and is connected to the housing of the rear axle. The propeller shaft is enclosed in a torque tube

which is flanged at its rear end and is there connected against the gearbox while at its forward end it terminates in a forked yoke which bolts flexibly against a cross member of the frame, thus permitting a rising and falling action of the rear axle. There is only one universal in the driving line and this is located at the front end of the drive shaft.

The floating rear axle is carried on Hyatt roller bearings. The outer bearing is mounted on the outside of the axle housing. By this arrangement the shaft does not carry the weight of the car but merely transmits the driving stresses. There is a thrust bearing on the axle shaft at its inner end, which takes up any side thrust.

#### Springs Are Longer

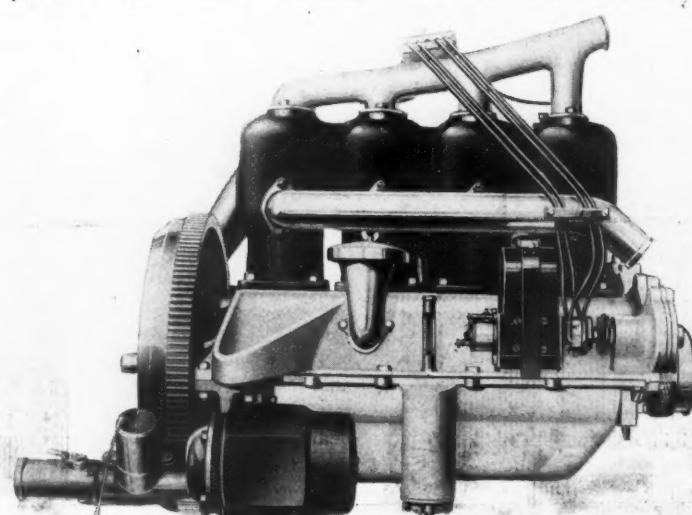
Longer rear springs are now used to accommodate the larger body. The dimension of this spring has been previously mentioned. The brakes are the same as on the model 79, having a drum diameter of 13 inches.

The front axle is new. It is a drop forged I-beam. The steering knuckle spindle is fitted with Timken taper roller bearings. While the steering gear has been moved over to the left side, it has not been changed in any other particular. It is an adjustable worm-and-nut gear with the housing bolted to the side frame. The steering wheel diameter is 18 inches in diameter.

In body work the Overland car for 1915 provides either a five-passenger body or a two-passenger roadster. There is also the four-passenger coupe. The body is a streamline design as described and the frame, running board brackets and battery box are concealed by mud shields, which add materially to the appearance of the car by giving it a long, low effect. In the car by giving it a long, low effect. Tires are carried at the rear of the car on all models. All cars come fully equipped with starting and lighting systems and carry side lamps, being one of the few 1915 designs which provide lamps in this position. The fenders are crowned and the latest ideas in top and upholstery work are used.

The body conforms to the most modern notions of streamline design, yet is without the suggestion of exaggeration or freakishness. The radiator with a shell consisting of a single steel stamping, joins its curve admirably to the characteristic slope of the Overland engine hood which gradually leads to the new cowl dash and sweeps, without angles or abrupt curves, to the full-curved tonneau back.

The combination of left drive, electric lighting and cranking, greater comfort and new body lines enhances the attractiveness of the car.



NEW ARRANGEMENT OF CRANKING MOTOR ON OVERLAND 80

# Grant Light Car, Practically Unchanged, Reduced to \$425

This Is a Cut of \$70—Only Roadster Marketed

**R**EDUCTION of \$70 in the price of its light car is the only change announced for the 1915 season by the Grant Motor Co., Findlay, O. The car is practically a continuation of the model brought out last season. The price for the new year is now \$425. The cut is made possible by the increased production at the Grant plant and is in line with the statement made last January that there would be a reduction when the production reached a given figure.

As a whole, the Grant car is essentially a typical light-car design. It has a four-cylinder power plant with the cylinders and crankcase cast together. The inlet and exhaust passages also are included in the cylinder casting and together with the inclosed valve action gives a very clean appearance to the exterior of the motor. The Grant company claims an output of 21 horsepower with the  $2\frac{3}{4}$  by 4-inch cylinders.

While completely inclosed, the motor has been made accessible by the use of a large plate at the top of the cylinders, which can be removed, making it possible to clean the cylinders and pistons without removing them. A removable plate also is placed on the base of the motor to permit of adjustment of the main and connecting rod bearing. Both the crankshaft and camshaft are forgings from alloy steel.

Bearings of these shafts are lubricated by constant-level splash, oil being fed to the crankcase supply by an automatic drop feed. The carburetor is hung at the rear right end of the motor and is kept low to insure a positive gravity feed. The heat radiated from the crankcase assists in the vaporization of the fuel as it passes up the intake pipe.

Ignition is accomplished by single magneto system, the magneto being carried on



FRONT VIEW OF THE 1915 GRANT CAR

## FEATURES OF THE 1915 GRANT CAR

*New price is \$425*

*Four-cylinder block motor unchanged*

*Bore and stroke  $2\frac{3}{4}$  by 4 inches*

*Wire wheels standard equipment*

a shelf at the forward right side of the motor. Cooling is by thermo-syphon and the water intake and outlet pipes are of large diameter to permit of a good flow through the radiator.

Power is transmitted to a leather-faced cone clutch to a two-speed sliding selective gearset. All the gears and shafts are of alloy steel, hardened and ground, and are carried on roller and ball bearings. The drive is by propeller shaft with a ball joint torque tube and the rear axle a three-quarter floating design mounted on roller bearings. On this axle the entire load of

the car is carried on the housing, only the driving stresses being transmitted through the axle shafts. The gear ratio of the rear axle is  $4\frac{1}{2}$  to 1. The front axle is a drop forging, having an I-beam section. It is heat treated and the steering knuckle pins are hardened and ground. The front

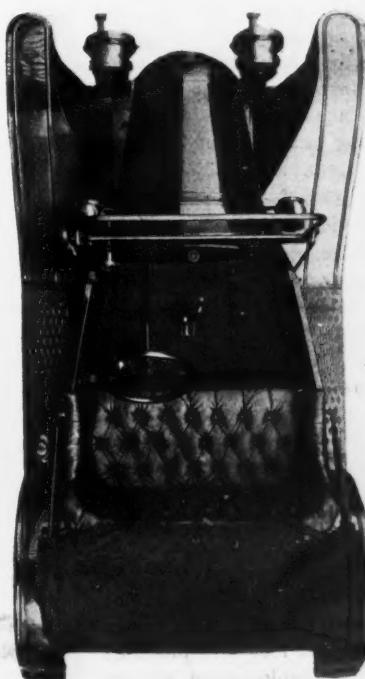
wheels are carried on ball-bearings.

Wire wheels are used as standard on the Grant car. They are 28 by 3 inches and carry Bailey tread tires. Both sets of brakes operate on drums carried by the rear wheels, the foot brake being external contracting and the hand emergency brake internal expanding. The brakes are lined with asbestos babbitt.

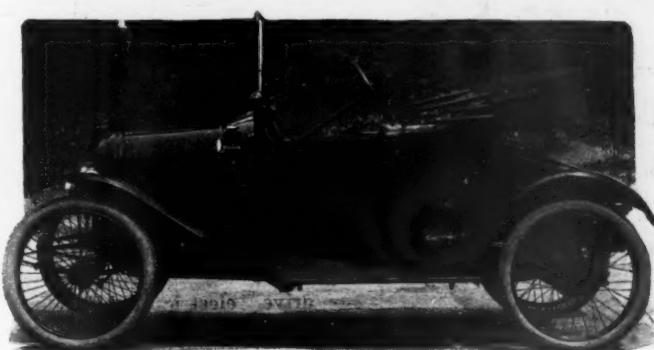
Two elliptic front springs are used and one semi-elliptic cross spring on the rear. The road clearance of the car under normal load is 10 inches. Steering is by pinion and gear. The frame construction is pressed channel steel of U section.

Bodies fitted to the car are two-passenger roadsters of fore-door design. They have a modified streamline effect, which is accentuated by the round radiator and the cowl

dash. The 5-gallon gasoline tank, which the maker claims is sufficient to carry the car for 150 miles, is mounted in the cowl. The weight of the car complete is 1,075 pounds. Standard equipment includes a full set of lights with acetylene generator, one-piece windshield, top and full set of tools. Electric lighting and starting and an electric horn are furnished at extra cost.



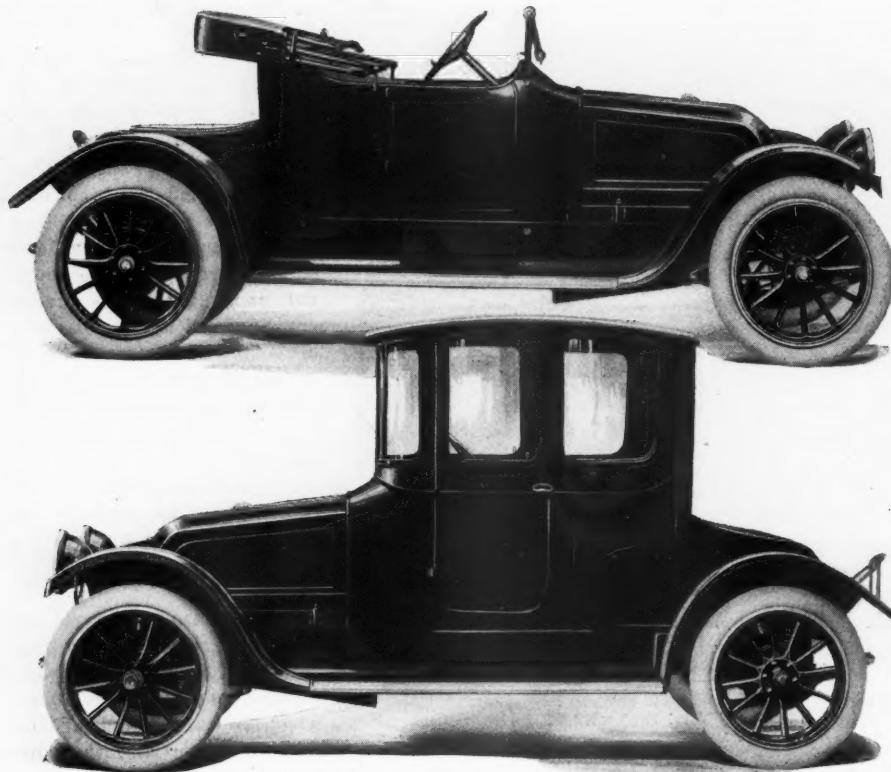
BODY VIEW OF THE GRANT LIGHT CAR



NEAT APPEARANCE OF THE NEW GRANT

# Franklin Cuts Prices and Adopts Skew-Bevel Axle Drive

Touring Car Dropped \$150—Chassis and Body Improved



UPPER ILLUSTRATION IS THAT OF THE NEW SERIES FRANKLIN ROADSTER AND THAT BELOW IS THE COUPE

**F**RANKLIN cars of the new series Six are changed from the former series Five chiefly by a reduction of \$150 in the price of the touring cars and roadsters, and a still greater reduction on the closed cars. The new series Six followed the series Five without a break in production and the reason assigned for the lower price is the fact that the factory has been able to reduce its cost materially by the concentration on one model, a step which was taken a year ago. The price for the touring car and roadster now is \$2,150, the coupe, cut from \$2,950 to \$2,600, the sedan from \$3,200 to \$3,000, and the berline from \$3,400 to \$3,200.

The single mechanical change of importance is in the adoption of a skew-bevel gear instead of the ordinary bevel type as the reduction between propeller shaft and axle. In brief, the new Franklin series Six is a single chassis embodying the Franklin features of air-cooling for the overhead-valve six-cylinder 3 $\frac{1}{16}$  by 4-inch engine, governor-controlled ignition-dish clutch, three-speed gearset, skew-bevel drive, floating axle, elliptic springs, and wooden frame members. The two last named features make for peculiar ease of riding and the wood framing assisted by the absence of radiator and waterjackets result in low weight which is a Franklin feature. With its wheelbase of 120 inches, the touring car weighs only 2,750 pounds.

Fuel and tire efficiency is made one of the strongest points of the Franklin design. Both of these are direct results of the low weight and the former is also a result of the valve-in-the-head construction of the engine, and the somewhat better thermal efficiency believed to be obtained by the slightly higher cylinder temperature obtainable in an air-cooled en-

## FEATURES OF THE SERIES SIX FRANKLIN

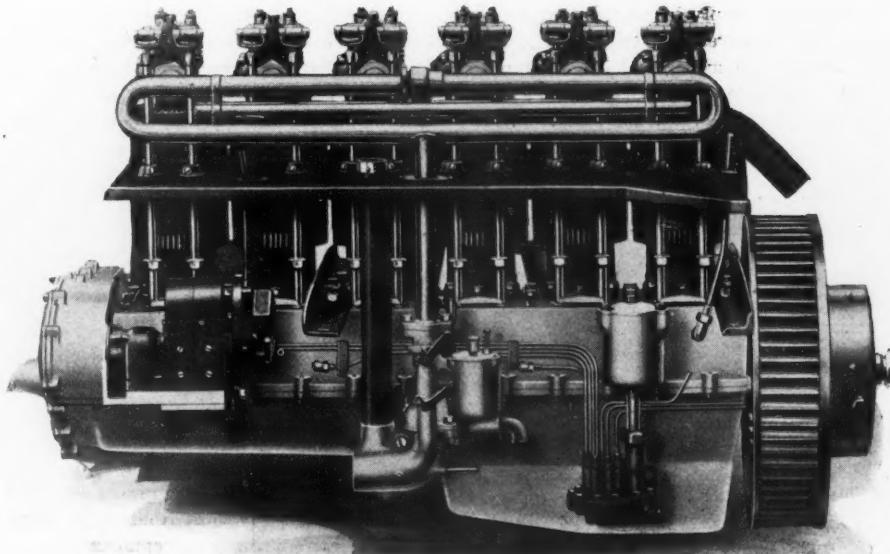
*All prices are lower than previously*  
*Skew-bevel differential*  
*Oil adjustment on the cowl*  
*Dyneto electric cranker*  
*Side lights eliminated*  
*Additions to equipment*  
*More graceful body lines*  
*Many minor improvements*

gine. The weight figure is not merely a factory rating; it has been attested in numerous semi-official measurements. For instance, the series Five touring car, which is a little heavier than the new one, was officially weighed by the technical committee of the Chicago Automobile Club, and found to be 2,750 pounds. The fuel economy of the car likewise has been recorded by semi-official tests. The average of ninety-four tests on May 1, 1914, of Franklin touring cars all over the United States was 32.8 miles per gallon.

### Body Lines More Graceful

Body lines of the Franklin are now more graceful than previous models. The body is larger, the seat sides higher and the upholstery finished more luxuriously than ever before. The sloping hood has been continued but has been given a more gradual slope and this in connection with the use of a shutter effect on the front of the hood instead of the old type grill, has given a more sturdy and powerful appearance.

The car remains mechanically practical.



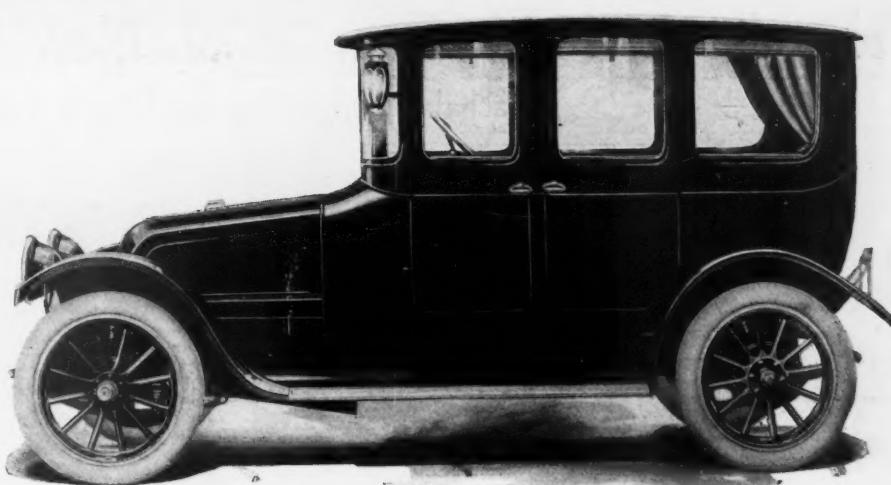
CARBURETER SIDE OF THE FRANKLIN ENGINE SHOWING THE SIROCCO FAN FLYWHEEL

ly the same as a year ago. In the motor only one change will be found and that is the fitting of the oil adjustment on the cowl board. The starter is lighter and more accessible than before and, while it is still the Dyneto system, it has been improved so that it is now 40 pounds lighter than the model used last year. Both the commutator and brushes have been improved to reduce wear at these points and according to Franklin engineers give three times the service.

#### Skew Bevel Axle Gears

Only one other change of importance is made on the chassis itself. This is in the rear axle. Now skew-bevel gears are used, whereas previously the straight bevel type was employed. These gears are made by the Brown & Sharpe Mfg. Co., and are adopted with a view to obtaining silent action. A number of little detail points such as the wing pivot bolts, front springs, magneto attachment, etc., have been improved. For instance, the magneto is now attached by means of two dowel pins and a divided metal strap over the top in place of the bolted-on brackets used in the earlier models. In the front springs the deflection was 1 inch to 180 pounds. It is now 1 inch to 200 pounds. No change whatever has been made in the rear springs. In the spring pivot bolts a new bushing has been employed which incorporates a felt washer intended to keep the dirt out and the oil in.

Better equipment will be found throughout the car. Most noticeable is the employment of either the Goodrich Silver-town cord or the Goodyear power saver tires as regular equipment. This is in line with the move made by makers of the highest-priced cars for this season. Another provision this year which is an innovation for the Franklin company is the fitting of a power tire pump. This is a Hartford single-cylinder design and the pump itself, together with the bracket sup-



ONE OF THE FRANKLIN'S INCLOSED BODIES

porting it and the clutch for engaging it to the motor drive, only weighs 6.5 pounds. By the use of this power pump the Franklin company claims to have removed the only excuse for the heavier demountable rim in place of the Q. D. type which they employ. This light rim equipment is in line with the work throughout the car where everything has been done to make it as low in weight as possible. On the series six the Golde one-man top with curtains that can be operated from the inside will be found. On this top the side curtains fasten to the windshield, making a weather-tight joint. In adopting this top a new style of windshield had to be fitted and this is now the double-glass, rain-vision, either half of which can be adjusted in any position.

#### Front Doors Are Wider

Front doors have been made wider and set back a little, permitting of easier passage in and out of the car. The fenders also are wider to better protect the sides of the body from mud and water. They are made after the same pattern as the former fenders but the rivets are now invisible. The side lights have been eliminated and the headlights have been equipped with two bulbs. These are 12-volt types and are connected in parallel. The electric terminal connection has been moved under the cowl board and a trouble lamp with a 12-foot cord is now supplied. The upper hinges of the door are concealed and the door handles are now on the inside. The battery location has been changed and while it was formerly invisible it is now both invisible and accessible, having been shifted from the chassis frame to a weather-tight box between the sill and the running board. The fuses are also located at this point so that it is easy to reach them for replacement.

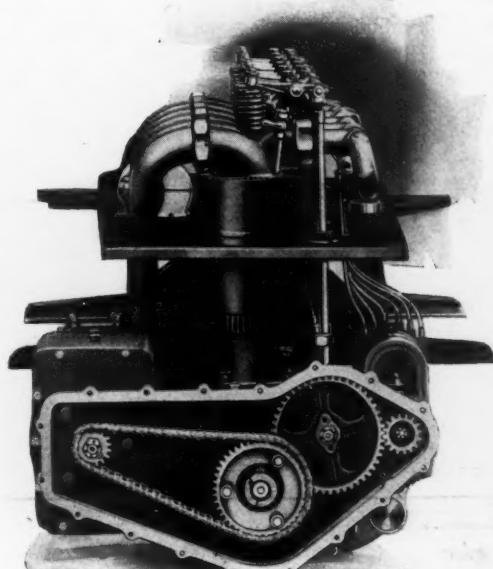
Franklin is one of the few cars which fits a luggage carrier as regular equipment. The design of this,

however, has been improved still further, and now folds up closer to the body. Extra tire carriers are also provided on the rear of the car. The instruments for the control of the car are now mounted on a cowl control board directly below the windshield. This board carries a speedometer, horn button, hand pressure pump, hot and cold air control, carburetor adjustment, oil control, starting and lighting switches. This gives a neater and more compact bank of switches than the previous design. The speedometer also is better, being a 60-mile Warner with a more accessible and more readily disconnected drive.

Air-cooling features of the Franklin have not been changed. In fact, none of the typical features of Franklin design, such as the wood sills, elliptic springs and light-weight methods throughout the car are altered in any way. The six cylinders are cast independently and have a bore of  $3\frac{1}{8}$  inches and a stroke of 4 inches. The valves are located in the head of the motor. Each cylinder has an independent valve mechanism operated by an overhead rocker arm and each valve can be removed and re-assembled without interfering with any other mechanism. The vertical air flanges surrounded by metal jackets are the main source of heat radiation in the direct cooling scheme used on the Franklin cars. The fan is a product of the Franklin company, having a series of blades which resemble the blades of a turbine.

Seven main bearings of plain type are used to carry the crankshaft. These bearings are babbitt lined and are hand scraped. The bearing supports are bridges in the upper part of the crankcase which is cut through along the crankshaft. These bearings are lubricated directly by a circulating force feed system. The oil is taken from the reservoir in the lower part of the crankcase, and forced by means of a gear pump through a series of individual leads, one of which passes to each main bearing. The oil sight feed on the dash

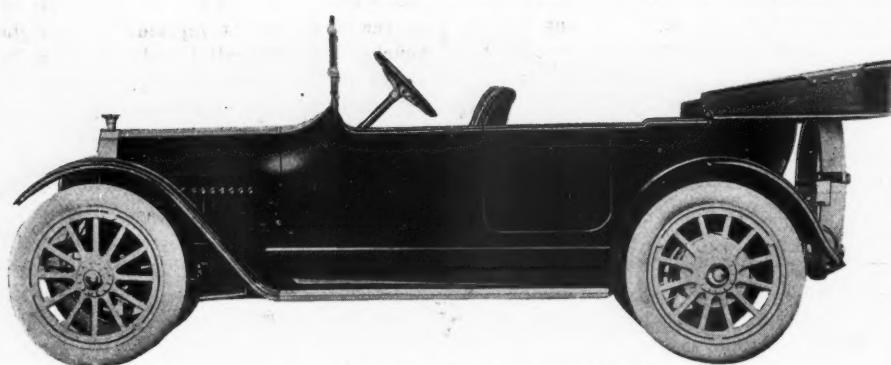
(Continued on Page 31)



FRONT VIEW OF THE FRANKLIN AIR-COOLED MOTOR

# Kisselkar's 1915 Four is of New Design Throughout

Detachable Sedan Top for Winter Use a Feature



NEW KISSELKAR WITH TWO-DOOR BODY

FOUR-CYLINDER productions of the Kissel Motor Car Co. have just been announced by the Hartford, Wis., concern and indicates a lower price than that of any previous Kisselkar. Also there is introduced an innovation in the shape of a detachable sedan top for winter use. The new four-cylinder car is known as model 36, and is the second 1915 model announced by this company, the first one being the 48-six described in Motor Age issue of May 21. Like the six, the feature of the new four is the two-door body design of the touring cars.

Model 36 is a new design throughout and differs in many respects from the Kissel four of the 1914 series, known as the model 40. The motor is a Kissel-built engine  $4\frac{1}{4}$  by  $5\frac{1}{2}$  block-east L-head construction, whereas the 40 was  $4\frac{1}{2}$  by  $5\frac{1}{4}$  east in pairs. Instead of the chain timing drive, as employed on the 40, the 36 has a set of three helical gears. The magneto is dispensed with, being replaced with a single battery system supplied by the Westinghouse lighting and ignition generator. Instead of pressure feed, the Stewart vacuum system is used.

#### Tires Are Smaller

Gear ratios have been changed somewhat and the tire size has been reduced from 36 by 4 to 35 by 4, though the wheelbase remains at 121 inches. These changes are accompanied by a drop of \$400 in the price, the new car listing at \$1,450. The sedan top comes at \$300 additional.

The two-door body design was described in detail in connection with the announcement of the new six. The two-door single-compartment body is made possible by the employment of individual chairs for the driver and his side passenger. This permits the use of a single door on each side of the body, which gives entrance to both front and rear seats so that there are two doors to the car instead of the conventional four doors. When the standard type of four-door body is desired it may be obtained as an option.

#### FEATURES OF NEW KISSELKAR FOUR

*Price reduced \$400, now \$1,450*

*Two-door, single-compartment bodies*

*Detachable sedan top at \$300 additional*

*Block motor,  $4\frac{1}{4}$  by  $5\frac{1}{2}$*

*Wheelbase, 121 inches; tires, 35 by 4*

*Vacuum fuel feed adopted*

The detachable top is a logical evolution of the two-door body design. The top fits snugly over the touring body, and is so simple in construction that two inexpert men can make the changes with a screw driver and a wrench. Six bolts and sockets, three on either side, and four top irons, one at each corner, are the only fastenings, and these are hidden neatly under the leather lining. The electric wiring connects automatically as the upper and lower halves meet. To convert the touring car it is necessary to remove only the windshield, summer top and moulding, then to screw a metal plate over the door latches.

It is emphasized that no sacrifice is made in looks, comfort or convenience, no unsightly obstruction of any kind appearing. The door hinges are entirely concealed, and all the refinements and niceties of the finest closed cars are preserved. The union of the upper and lower door is accomplished by means

of dowel plates, and the latch of the united door is just above the joining point. Removal of the detachable top reveals the two-door touring body with individual forward seats. The conventional four-door body for five passengers is offered for the same price, and for \$100 more, two disappearing seats and extra tires are included.

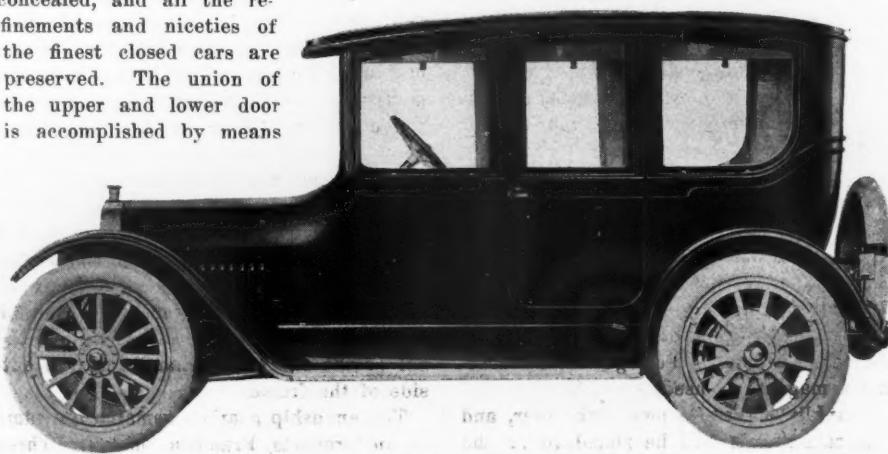
#### New Motor Details

The motor has been making from  $2\frac{1}{2}$  miles an hour to 50 miles an hour on direct drive, and showing remarkable conservation of fuel, according to Kissel engineers. It has 2 3-16 inch valves with nickel-steel heads. Both valves and lifters are completely housed. The aluminum crankcase is very rigidly constructed with parting line two inches below crank shaft. The crankshaft is of extra large diameter in accordance with now generally accepted engineering principles. The motor bearings, too, are unusually liberal.

The upper water pipe covers a large opening at the top of the cylinder block, giving free access to the waterjacket for cleaning purposes, and making impossible the usual clogging with sand and sediment. All cylinders are sand blasted and milled on a special machine designed to insure the utmost accuracy. All four holes are bored at the same time, giving alignment and interchangeability.

Oil is drained back into the reservoir in the lower part of the oil basin, through a fine screen before entering the pump for redistribution. The oil basin, which is of aluminum alloy, has troughs into which connecting rods dip, and these are filled by means of a positive gear pump which furnishes a uniform stream of lubricating fluid.

Quiet and smooth motor operation is enhanced through the use of only three timing gears to drive the camshaft, circulating pump and magneto. These gears are of the helical type, and have very wide faces. The camshaft is of special alloy steel, very wide in diameter, and



NEW KISSELKAR WITH SEDAN TOP IN PLACE

supported on large white-brass bearings. A 16-inch safety-blade fan, that can under no circumstances cut the radiator, is notable. A special design radiator of the Mercedes honeycomb type is used. Carburetion is obtained by special type of Stromberg carburetor, connected directly to the cylinder block, thus doing away with intake pipes.

#### Lighter Transmission

The power plant is a single unit with a three-speed gearset. The leather-faced cone clutch is integral with it and is accessible for adjustment by removing a manhole cover located amidships. Adjustable spring inserts are placed under the leather to insure a smooth and easy engagement without slipping or grabbing. The transmission is simplified and lightened over previous Kisselkar models weight being reduced wherever consistent with safety and long life. All gears and shafts are of nickel steel, heat-treated, it is claimed.

Starting, lighting and ignition are in two units, the starting system, used on this car for the last year being retained. The starter is operated by a plunger in the floor, convenient to the driver's foot. The starter motor engages in teeth cut in the flywheel of the engine.

The latest Westinghouse system of ignition and lighting has been adopted. The outfit consists of an electric generator operated by a gear driven from the engine. While the engine is not running, or at a low speed, the lights are supplied by a current from a storage battery. A

magnetic switch automatically connects the generator to the lighting system and battery when the car motor is running at 4 miles an hour on direct drive. The units of this system, aside from the generator, consist only of a lighting switch, an ignition coil, a timer, and a distributor. The generator is free from friction clutches, and is inclosed.

All electric wires on the 36 are centralized on a panel attached to the front of the dash. This feature permits the instant location of trouble, and in addition makes it possible to remove the body without cutting a wire.

#### The Control Features

Control levers, situated at the driver's right in the center of the car, are long and within ready reach. The car is driven from the left side, in accord with now commonly accepted practice. All instruments are mounted in a straight line of the dash, and a neatly constructed cornice above them conceals a row of miniature light bulbs which provide illumination at night without the usual objectional glare. The differential is mounted on taper roller bearings as are the front and rear wheels. In the gearset, imported F. & S. annular ball bearings are used. The supply gasoline tank, mounted on the rear of the chassis, has a capacity of 18 gallons. The springs, both front and rear, are guaranteed against center breakage during the life of the car. Instead of a center bolt a retaining plate between the center clips holds the leaves in position.

mechanism is mounted in the center as before. On direct drive the reduction of the Franklin cars is 3.71 to 1. The rear axle is a semi-floating design which remains the same as in the series five except as the skew bevels replace the straight bevel. The differential and pinion shafts are carried on roller bearings. Taper roller bearings are used throughout the rear axle construction. Aluminuim is used throughout the car wherever possible, and example of this is the rear axle gearcase, which is a model of lightness.

Types of bodies fitted to the one Franklin chassis are the touring car, roadster, coupe, sedan and berline. The weights of these cars are respectively 2,750, 2,630, 2,788, 2,924 and 3,121 pounds, fully equipped. The standard color for all types is Brewster green with black trimmings. All the bodies are aluminum over a wood frame. The chassis frame is second growth ash made in laminations and is said to be stronger than steel.

#### PROTECTING THE RED CROSS

Milwaukee, Wis., Aug. 10.—A crusade against the illegal use of the Red Cross emblem on motor cars of physicians, ambulances and other vehicles has been put under way by the United States district attorney at Milwaukee, and about fifty prominent physicians and officials of the municipal government are waiting with fear and trembling the result of federal court indictments.

All have pleaded not guilty upon suggestion of the federal judge, although in most every case the defendant was prepared to plead guilty. There being no precedent, Judge F. A. Geiger suggested a not guilty plea to afford time to look up the constitutionality of the act and to decide in what manner fines should be imposed. It is likely that all defendants will finally plead *nolle contendre* and be subjected to nominal fines.

The crusade was extended to include several motor car supply dealers who carry stocks of Red Cross emblems for physicians and hospital vehicles. Among the defendants is Julius Andrae & Sons Co., one of the largest accessory houses in the northwest. For many years Milwaukee physicians who motor have carried the emblem on the front and back of their cars to facilitate passage through traffic. The act under which the arrests were made is one which prevents the use of the Red Cross Society's official emblem either for commercial or advertising purposes. It is stated that the crusade will be continued until the general use of the Red Cross by unauthorized persons is discontinued.

#### NOW WINTON MOTOR CAR CO.

Cleveland, O., Aug. 10—Papers have been filed with the secretary of state changing the name of the Winton Motor Carriage Co. of Cleveland, O., to the Winton Motor Car Co.

## Franklin Has Skew-Bevel Axle Drive

(Continued from Page 29)

is in the direct circulation line and by its use the operator can note the amount of oil passing through the system.

Lighting and starting is accomplished by the 12-volt Dyneto outfit. In mounting this electric system, the primary object has been to make the motor generator as accessible as possible and at the same time to place it in such a position that it would be most apt to remain clean. The system consists of a motor generator connected to the crankshaft by a silent chain drive. A storage battery floats on the line. The winding of the motor-generator is such that it acts as a generator at speeds of above 12 miles per hour and at this time begins to charge the storage battery. At speeds below 12 miles per hour the motor generator can act as a starting motor and draw current from the battery which is utilized in assisting the engine. There is a reverse-current cutout which prevents the battery from discharging itself through the motor generator when the car is stopped. For ignition an Eisemann magneto is used.

Franklin makes its own carburetor, and this season this will be found to be the same as in the previous model, except for

the dash adjustment of the gasoline supply, which is a new feature. A rod operating on the needle valve and terminating on a ball-ended handle which is in easy reach of the driver secures immediate adjustment.

Fuel is fed to the carburetor by gravity. The tank is located under the front seat and has a capacity of 14½ gallons. There is a reserve tank of 2½ gallons. Also there is a gasoline valve and separator in one fitting on the bottom of the gasoline tank and the handle for operating it is on the top of the tank under the driver's cushion. The valve provides a main, reserve and closed position and in this way the driver is always certain of sufficient fuel to reach the next supply station, should he be caught unaware.

In the clutch no change will be found. It is a multiple disk running in oil and is housed within the flywheel of the motor. A feature which is continued is the lubrication with graphite grease of the clutch trunnion by means of a cup carried on the sill of the car with a handle on the outside of the frame.

The amidship gearbox remains the same as in previous Franklin models. Three speeds are furnished and the gearshifting

# A New Six and a Four Announced by Moon Company

## Larger Six Retained—New Streamline Bodies

Two new streamline-bodied cars, the 6-40 and the 4-38, together with the improved 6-50, are announced by the Moon Motor Car Co., St. Louis, as its 1915 line of passenger vehicles. With the new type of body on the 6-50 it hardly can be classed as a carried-over model and the mechanical improvements incorporated are enough to warrant the car being called a new one.

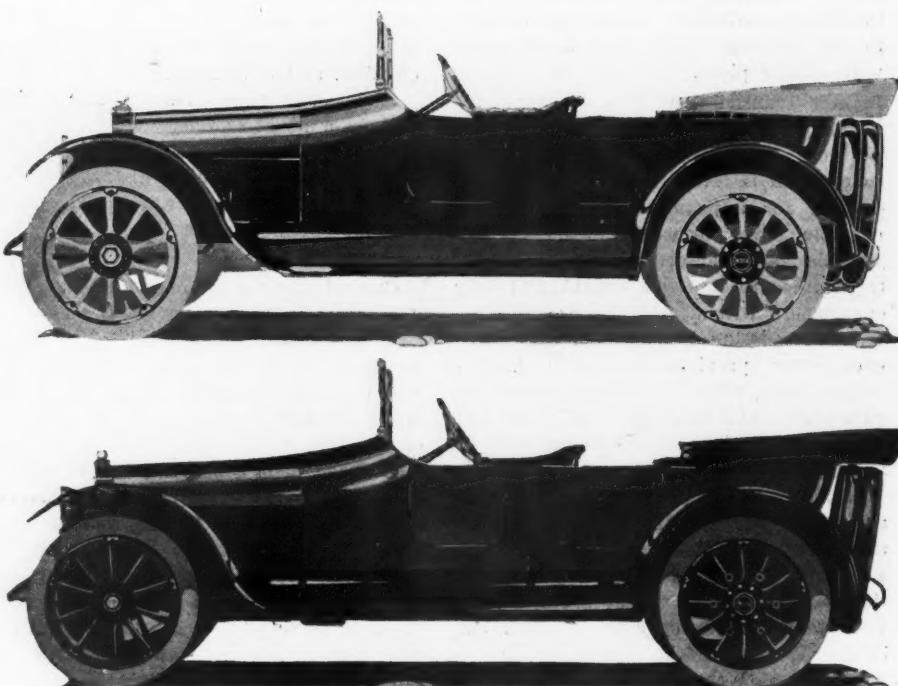
The 1915 season marks the passing of Moon-made motors and all three cars now are equipped with Continental engines. In 1914 the four-cylinder car marketed was the only one with a Moon engine and with the bringing out of the two new models, Continental motors are used exclusively.

Although fundamentally all three cars give evidence of the Moon practice of 1914, there have been a number of mechanical changes with a view to decreasing weight, improving the riding qualities and giving better service. The new four sells for \$1,350, the new light six at \$1,575 and the improved 6-50 at \$2,250, which is the same as that asked for the 1914 model of that car. The new four and new six are equipped with roadster and five-passenger touring bodies only, at the price mentioned, while the 6-50 comes through with roadster, four, six and seven-passenger bodies.

### Many Changes in 6-50

The changes in the 6-50 are important ones. The wheelbase has been increased from 129 to 130 inches, the doors widened from 21 to 22 inches, the rear seat upholstery has been made deeper, more leg room has been provided for the driver and the tonneau extra seats improved upon. The disk clutch has been reconstructed and the method of holding the plates changed so that wear is reduced.

It is stated by the Moon company that 150 pounds has been removed from the rear axle, due principally to the adoption of a crucible steel housing instead of the malleable iron one used in the 1914 car. The brake drums on the rear wheels have been increased from 14 to 16 inches diameter, the silent-chain drive of the Delco distributor adopted and a new brake-



UPPER ILLUSTRATION SHOWS THE NEW MOON 4-38 AND THE LOWER ONE THE NEW 6-40

### FEATURES OF THE 1915 MOON LINE

*All cars have Continental motors*

*Four sells at \$1,350 and new six at \$1,575*

*Larger six price unchanged at \$2,250*

*New type of body on all cars*

*Weight reduced on the large six*

*Additions to equipment*

*New braking system on the three cars*

*Improved rounded radiator*

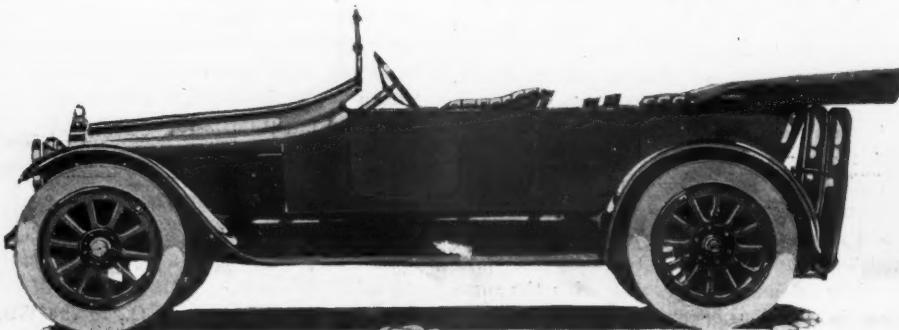
The four has shown 21 miles to the gallon of gasoline, according to the Moon company. Its motor has a bore and stroke of  $3\frac{3}{4}$  by 5 inches, with L-head cylinders cast in block. It is stated that this engine shows 44 horsepower at 2,200 r. p. m.

### Delco System Installed

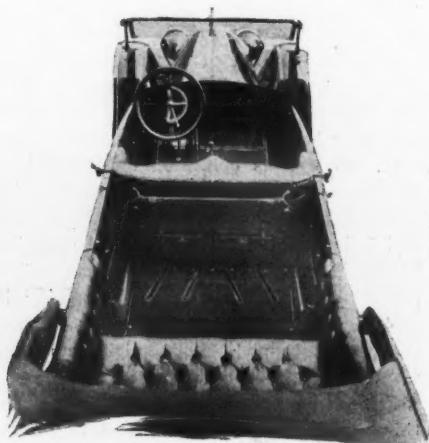
An improved one-wire Delco starting, lighting and ignition system is used and an added feature is the Stewart-Warner vacuum feed by which the carburetor is fed by gravity even though the fuel tank is located in the rear of the chassis. The engine drive is taken by a dry-disk clutch and then by a three-speed selective gear-set, both of these members with the motor forming a unit power plant. Both clutch and gearset are products of the Warner

equalizing system installed. A Klaxon horn and Stewart-Warner vacuum-gravity fuel feed are additions to the equipment.

The 4-38 and the 6-40, entirely new cars for this season, are somewhat similar in construction and in general appearance.



MOON MODEL 6-50, WHICH HAS A NEW STREAMLINE BODY



BODY VIEW OF THE MOON TOURING CARS



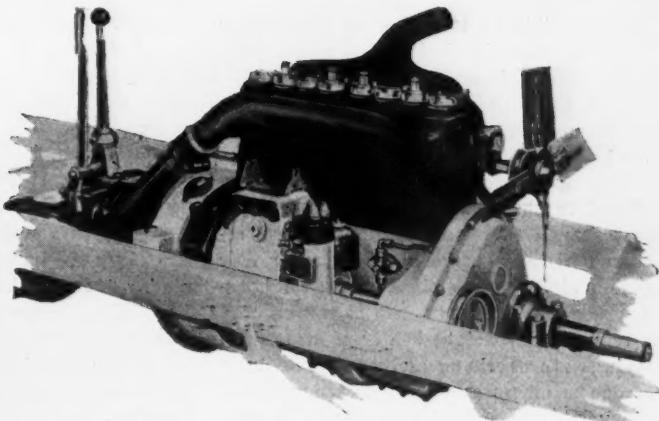
DRIVER'S COMPARTMENT ON THE NEW MOONS HAVE MORE LEG ROOM

Gear Co., Muncie, Ind. The propulsion of this as well as the new six is by the Hotchkiss drive, which eliminates the torque rod, simplifies the chassis and makes the springs take most of the driving strains. The Moon company has adopted a new type of braking system in all of its 1915 cars, the system having been designed by engineer H. L. Goodspeed, who has reduced the number of parts from 50 to 22. In the 1914 cars an equalizer system was in use, which required a long equalizing beam at about the center of the chassis. In the new system a more direct action from pedal to brake bands is obtained with a smaller equalizing beam in the rear, almost above the rear axle housing. Brake adjustment is easier and danger of binding from lack of lubrication is eliminated.

#### Underslung Rear Springs

The 4-38 has a wheelbase of 120 inches and has underslung rear springs which so lowers the body as to give it a decidedly smart appearance. This body, as well as those of the other Moon cars, is of the true streamline type with a graceful curve from the windshield base to the radiator. The radiator is a new one with a slightly rounded front. The driver's compartment affords about 44 inches of leg room and the tonneau also is comparatively roomy. Concealed hinges and locks, clean running boards, crowned fenders and other features in demand, are to be seen on the new Moon. Drive is left with control levers in the center, with the instruments cleverly grouped on the cowl board. The headlights afford illumination for country and city driving and the dimmer control is operative from the dash.

The new Moon six reflects many of the features of the new four but with its



THE NEW FOUR-CYLINDER CONTINENTAL MOTOR ON THE MOON 4-38

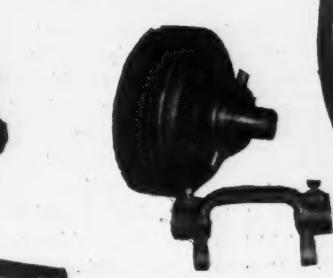
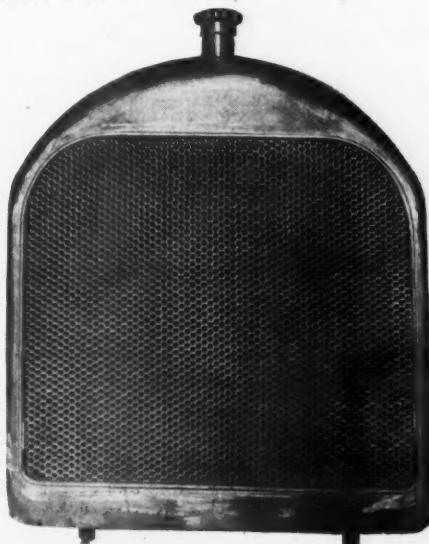
larger body, greater power and light weight, supplies the demand for a car midway between a four and a heavier six. The Continental motor in this machine is of L-head construction, with cylinders cast in block and with a bore and stroke of  $3\frac{1}{2}$  by 5 inches. All Continental features, such as helical timing gears, splash-pressure oil feed, large bearings, etc., are to be found on this engine.

The clutch and gearset, in unit with the motor, are of similar general design as those used in the four, but the parts are

slightly heavier to care for the greater strains. The drive from the three-speed gearset to the floating axle is by shaft and bevel gearing. The new brake equalizing system described in a previous paragraph is a feature of this car also. The springs are underslung and the drive is taken through them as in the four, eliminating all the usual driving members. In order to obtain a short turning radius the frame has been narrowed in front.

The new rounded radiator, Stewart-Warner vacuum feed, roomy body and Delco cranking lighting and ignition system are features on the 6-40 Moon. The streamline body is somewhat on the same order as that used on the four, as may be gained from the illustration. Drive is left with control in the center and the cowl arrangement, carrying of the extra tires in the rear and the general interior body arrangement is the same as in the four. The wheelbase is 120 inches and the tires 34 by 4 inches.

The carried-over model, the 6-50, has the same engine as used in the 1914 model with improvements in detail and the equipment necessary to bring it up to date. The cylinders have a bore and stroke of  $3\frac{3}{4}$  by  $5\frac{1}{4}$  inches and are cast in blocks of three. The Delco system of improved design has been installed and the circuit-breaker feature of 1914 retained. With this breaker



THE NEW MOON RADIATOR IS SHOWN ABOVE AND THE PERFECTED CLUTCH AND ITS PARTS IS ILLUSTRATED BELOW

it is possible to tell whether there is an open or short-circuit in the system. The battery for this system is an Exide and is placed behind the apron near the front right fender. Circulating splash oiling is used and cooling is by centrifugal pump.

The new type of disk clutch has been placed in this chassis but the gearset of last year, a four-speed affair, has been retained without changes. The floating rear axle and Moon one-piece rear axle housing are as before, with the exception that a reduction in weight has been made. The springs are overhung and the drive is by torque members as in the 1914 model and the new type of brake equalizing system

is used. A rear axle feature is the centrifugal oil-draining device, inside the hubs, which gathers oil likely to make its way from the differential housing to the brake drums.

The new 6-50 body has very pleasant lines and of similar design as the other 1915 cars and the tonneau and driver's compartments made roomier. The tires used are 35 by 4½ inches and the equipment includes Stewart-Warner vacuum fuel feed, headlight dimmers, top, with boot which also covers the top bows, Deleo system, clock, speedometer and other instruments set flush in the cowl board and Collins curtains.

various methods of sales procedure. The dealers then entered upon a general discussion on the problem of handling used cars and the policy of taking them in trade for new Packards. High-class advertising, demonstrations, attractiveness of window display, were also among the topics discussed. A parade of thirty-eight new demonstrators headed by the Packard band followed. Then followed a baseball game and a swim in the Detroit river. In the evening Sappho was chartered for a cruise on Lake Saint Clair, and this was enlivened by boxing bouts between members of the Packard Recreation League.

## Movies Tell Maxwell Company's Story

### Novel Scheme to Interest Buyers

**C**HICAGO, Aug. 7.—One of the largest motor car advertising projects brought to the public eye has just been started by the Maxwell Motor Car Co., Detroit, Mich., in the form of a five-reel moving picture entitled, "From Molten Steel to Motor Car." It shows various factory machinery, the method of building the car and other incidents, connected with the selling and performance of the Maxwell 25.

The first release was shown today at the Congress Hotel, to more than 150 middle-west Maxwell dealers who came to Chicago at the invitation of Charles Strieby, a factory man in charge of the moving picture advertising campaign. The men had luncheon at the hotel, then after a short talk by Mr. Strieby the pictures were shown. Many of the automatic machines, those making parts requiring four, five, six and as many as eight operations, are demonstrated, as well as the spring tester and machine for determining the tensile strength of the materials of Maxwell construction.

The spectators are taken through the factory from the foundry to the shipping platform. The drop forge machines are shown and in the picture a man is seen making lamp brackets. Cylinder grinding, front-axle drilling, rear axle casing making, and innumerable other operations are shown, and after the mechanical construction is given the assembly departments are projected. The screen then shows motor assembly and motor testing, chassis assembly and testing. The observer is taken through the body room, the upholstery department and, in fact, after the reels showing the mechanical details and body work of the car have been seen, the spectator has nothing to ask concerning the Maxwell 25.

In the five-reel picture the last two reels are devoted to the selling and performance of the little car. One reel is taken with a story of a girl who wished to have a motor car and urged her father to purchase one for her. The father is shown reading the Maxwell catalog. After some

persuasion by the daughter he leaves the house for a trip along motor row to inspect the car. He stops at the Maxwell agency, examines the car, and then rides to his home with the agent. After a demonstration the man buys the car and the next scene shows his daughter driving it alone and later taking out five of her friends. The Maxwell 25 then is shown in various hill-climbing stunts that have taken place on the Pacific coast. The climbing of Mt. Rubidoux is but one of the feats shown; while many incidents connected with other Maxwell performances of note also are screened.

About \$150,000 has been spent in the production of forty-eight sets of this film, and it is the purpose of the company to show the five reels in every important center in this country.

### PACKARD DEALERS IN SESSION

Detroit, Mich., Aug. 7.—The Packard sales session which started Wednesday, August 5, ended today, 125 dealers and salesmen from different parts of the country having been in attendance at the 3-day session.

Vice-president and general manager Alvan Macauley, who opened the meeting, welcomed the Packard dealers and expressed the appreciation of the company for the work they had done during the year just ended, which was one of the best in the history of the company. That 1915 will be even a bigger year was Mr. Macauley's opinion, and he believes that the European war means a great future for the high-grade American car in Europe.

Vice-president S. D. Waldon spoke about the new Packard models. Chief Engineer J. G. Vincent followed and gave a detailed technical talk concerning the Packard construction. This concluded the day's session of business and was followed by a frog and chicken "session" at the Detroit Boat Club.

Tuesday the first speaker was sales manager H. H. Hills, who took up the

### JEFFERY ENTERTAINS DEALERS

Kenosha, Wis., Aug. 6—Nearly 300 dealers in Jeffery cars gathered at the plant of the Thomas B. Jeffery Co. here for a 2-day convention, the first, held yesterday, being devoted to the discussion and sales talk on passenger cars and the second occupying most of Wednesday, being set aside for commercial car talks and a lecture on the Bijur cranking and lighting system used on the Jeffery Chesterfield six.

The 300 dealers came from all corners of the United States as guests of the company and all the hotels in Kenosha as well as a number of private residences were thrown open to the dealers. The Jeffery company engaged a Chicago caterer to furnish meals for the dealers and the factory showroom was converted into a dining-room.

### OVERLAND RETIRING STOCK

Toledo, O., Aug. 10—The Willys-Overland Co., through its New York agent, the Bankers' Trust Co., has sent letters to all holders of Overland \$5,000,000 preferred, asking them to set prices on their stock. During the present month \$250,000 of preferred stock will be retired, in accordance with a provision of the company's charter.

"The redemption price of our preferred stock is \$110 a share," said Royal Scott, of the Overland general offices. "The Bankers' Trust Co. has been authorized to go into the market and procure the \$250,000 of stock that is to be retired. Stockholders will be given a chance to offer their stock at redemption price, or less. If a sufficient amount is not offered voluntarily, redemption of the required amount will be forced. The letters from stockholders will be opened August 25 or thereabout."

### EUROPE TO STANDARDIZE RIMS

Paris, July 29—Official announcement will be made shortly by the general secretary of the International Union of Automobile Manufacturers of the general adoption by all European countries of the S. M. M. A. standard for rims and tires. The British standardized millimeter rim was decided upon in June of last year and tolerances adopted in September, 1913.

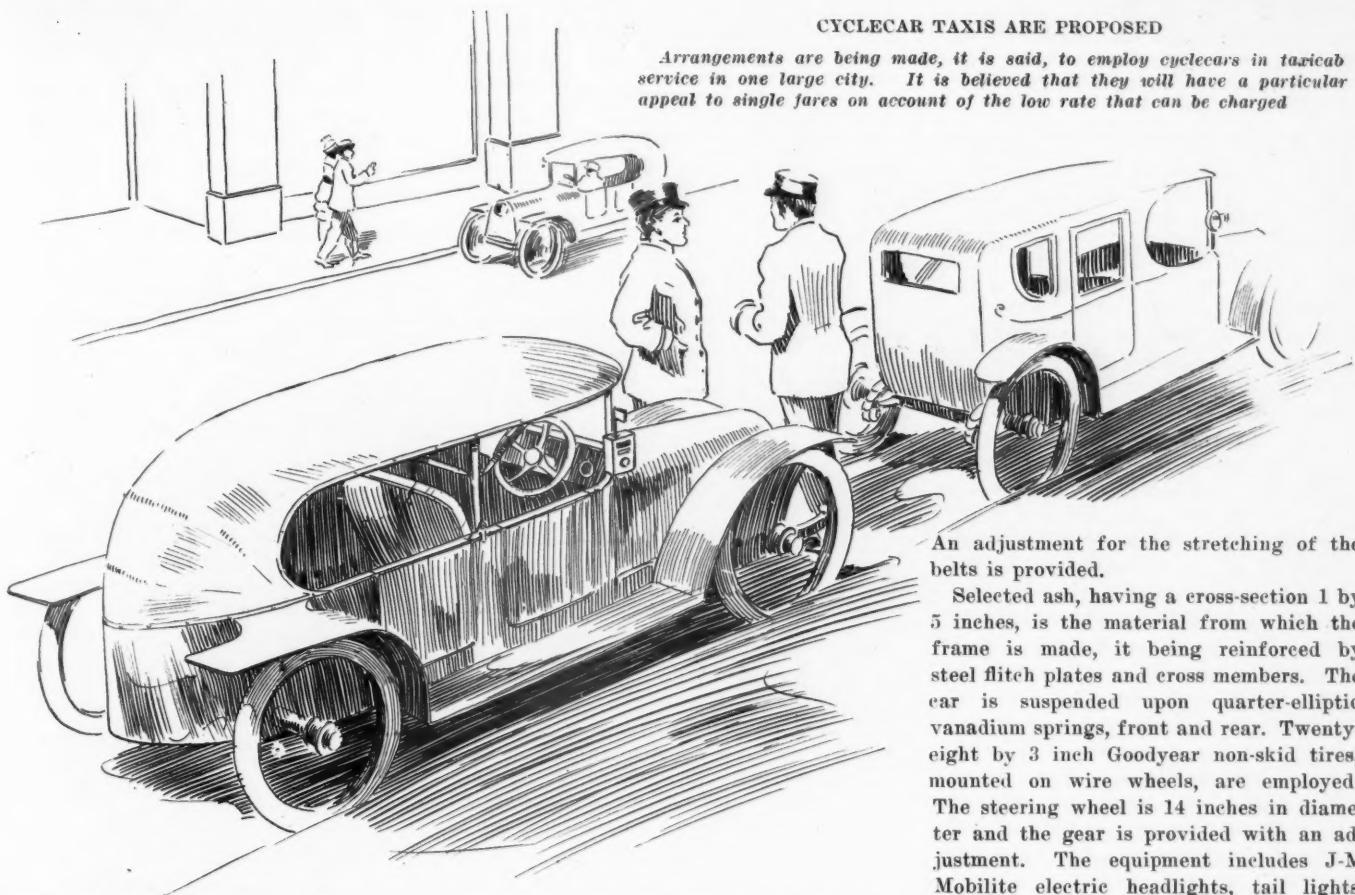


# Cyclecar Development



## CYCLECAR TAXIS ARE PROPOSED

*Arrangements are being made, it is said, to employ cyclecars in taxicab service in one large city. It is believed that they will have a particular appeal to single fares on account of the low rate that can be charged*



### NEW LOS ANGELES CYCLECAR

THE Los Angeles Cyclecar Co., Compton, Cal., announces the details of its new product, which is called the Los Angeles. It has a four-cylinder, water-cooled engine,  $2\frac{3}{4}$  by 4 inches, which the company credits with 18 horsepower. It has friction drive with double side chains from jackshaft; the wheelbase is 100 and the tread 44; tires are 28 by 3; springs are semi-elliptic; gearshift levers are in the center and the friction transmission gives four speeds forward and reverse.

There is a foot brake on the jackshaft, with hub brakes for emergency. The frame is underslung and is a channel section pressed-steel. Road clearance is 10 inches. The steering wheel is 16 inches aluminum spider with the drive on the left side. The body is a side-by-side seater roadster with a pointed radiator, wire wheels and the chains inclosed in steel housing and running in oil. The equipment includes two 8-inch electric headlights, a taillight, horn, top, storm curtains, adjustable windshield and tools. The price is \$495.

### NEW BICAR AXLE

Feeling the demand from light-car builders for a light type of axle, the Engineering Equipment Co., Indianapolis, Ind., is manufacturing this part for shaft-drive

machines of the cyclecar or light-car type. It is designed for cars weighing not over 1,100 pounds and for motors of not over 100 cubic inches capacity. It is built in 36- and 56-inch treads.

The construction follows standard car practice, with bevel gear reduction and differential, internal expanding brakes, and fitted throughout with Hyatt roller bearings. The shafts are made of high-carbon steel and the housings of aluminum. Both internal and external brakes can be fitted if desired.

### BURROWS ANNOUNCES CYCLECAR

A long, narrow hood, high cowl and tandem seating mark the \$375 Burrows cyclecar. It is equipped with a 13-horsepower, two-cylinder, air-cooled motor which has its cylinders set at an angle of 45 degrees. The crankshaft is carried on imported annular ball bearings. Ignition is supplied by an Atwater-Kent Unisparker and carburetion is furnished by a Schebler automatic type.

Speed changes are provided by a friction transmission located forward of the driver, and it gives four speeds forward and reverse. The jackshaft is a special, flexible design, mounted on annular ball bearings. Final drive is by double V-belts to large pulleys on the rear wheels.

An adjustment for the stretching of the belts is provided.

Selected ash, having a cross-section 1 by 5 inches, is the material from which the frame is made, it being reinforced by steel flitch plates and cross members. The car is suspended upon quarter-elliptic vanadium springs, front and rear. Twenty-eight by 3 inch Goodyear non-skid tires, mounted on wire wheels, are employed. The steering wheel is 14 inches in diameter and the gear is provided with an adjustment. The equipment includes J-M Mobilite electric headlights, tail lights, horn, and full tool equipment. Its weight is 700 pounds. This cyclecar is manufactured by the Burrows Cyclecar Co., Ripley, N. Y.

### RAYBESTOS CYCLECAR BRAKE

The Royal Equipment Co., Bridgeport, Conn., has announced a special brake for cyclecars. The external type brake is made of cold-rolled spring steel lined with Raybestos and can be used either as a service or emergency brake operating from the foot pedal or hand lever. It is constructed to fit any layout of housing and levers of various designs can be applied so that the brake can be operated at any angle. An internal expanding brake also is made for cyclecar service.



Raybestos brake for cyclecars

# The Readers' Clearing House

## DYNAMO FOR BATTERY CHARGING Wants to Use Lamp Bank for Controlling Current Flow

HAWARDEN, Ia.—Editor Motor Age—I have a Buick model 28—this year's small four tour-ing car. The battery is almost completely exhausted because I have been unable to drive the car except on trips between home and town and generally at slow speed. I have in my home a Fairbanks-Morse lighting outfit with a 32-volt direct current dynamo. The dynamo is a 9-KW, 28-ampere machine. Can Motor Age advise me how I could connect my storage battery up with this system so as to recharge it? How many lamps would I have to use, and of what size?—L. R. French.

The dynamo would have to be operated at rather slow speed for the charging rate of a battery is usually about 5 to 10 amperes. You will have to give your battery a long, slow charge to bring it back to life. The lamp bank should contain a sufficient number of lamps to consume 5 amperes, should that be the charging rate. If you are going to charge at a 5-ampere rate you should give the battery an initial rate of 2 amperes and then gradually increase it until you get to five. The dynamo should be connected in parallel with a lamp bank containing about 15 110-volt, 16-candlepower carbon or gem lamps. Ten of these lamps will consume approximately 5 amperes, but the extra five lamps are used for adjustment purposes. An ammeter should be placed across the battery terminals so you can tell at what rate it is being charged.

## ADVANTAGES OF SPRING TYPES Suspension Depends Largely Upon Weight Distribution and Load

BROOKLYN, N. Y.—Editor Motor Age—What are the advantages and disadvantages of the semi-elliptic, elliptic and three-quarter elliptic springs?—A Subscriber.

The advantages and disadvantages of the various types of springs depends upon weight distribution and the design of the car. One form of semi-elliptic spring may be superior to a certain form of elliptic or three-quarter elliptic, and vice-versa.

Spring suspension has been a great problem to motor car engineers, because the car of necessity must travel over rough roads and at slow and high speeds. If the object of the springs is understood clearly the relative advantages and disadvantages of the various forms will be understood more readily. Springs must support certain members of the car, they must absorb the shock transmitted by the road wheels. Springs to be efficient must prevent the body of the car from side swaying. In other words, the springs of a motor car must be strong to support a load and resilient to make riding easy.

The semi-elliptic spring is used in the majority of vehicles, in the front and in many also in the rear. This type reduces side sway greatly and yet is not hindered in its movement. This type is adapted to carry great weight without the tend-

ency to permit side sway. If semi-elliptic springs are made to be exceptionally resilient they must be made long. This adds to the cost and at the same time increases the tendency to side sway.

Stiff semi-elliptic springs are not to be desired when shock absorbing qualities are factors, for when a car with such springs strikes an obstruction on the road the tendency is for the wheels and axles and perhaps a portion of the car to leave the ground.

In the elliptic spring the tendency to side sway is unusually great. This type of spring if made to be as strong as the semi-elliptic will perhaps lose much of its resiliency. Average design shows that the elliptic is far more resilient than the semi-elliptic and better able to absorb shock. In the three-quarter-elliptic type the problem is more a manufacturing problem than any. If this form is used the overhang is lessened, which calls for a longer wheelbase.

### Speed of National Speedway Roadster

STREATOR, Ill.—Editor Motor Age—What is the speed of the National speedway roadster of 1911 and 1912 on second?

2—What is the speediest American car built, and what speed does it maintain?—G. S. Brown.

1—There are no complete records of the speed of the 1911 and 1912 National speedway roadsters, but advice from the factory states these cars often ran as high as 55 miles per hour. When stripped for racing

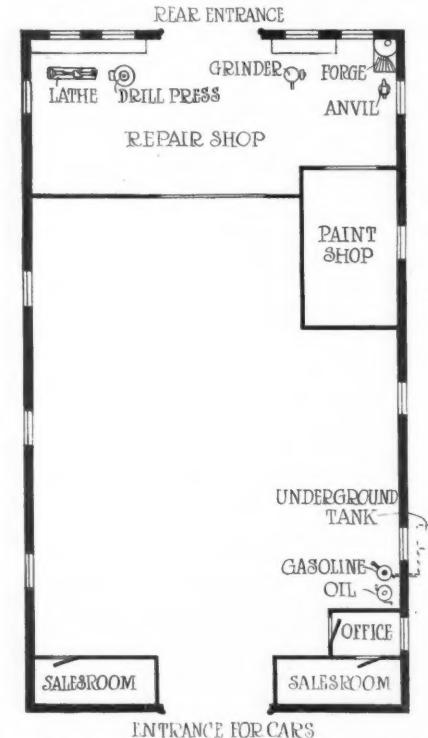


Fig. 1—A city garage floor plan showing the location of the various departments and the repair shop installations. This is a general plan with a view to giving arrangement suggestions.

these roadsters could travel 90 miles per hour on high and 70 on second speed, the factory claims.

2—Perhaps the fastest two-passenger cars are the Stutz, National and Mercer. These cars in roadster form can do 70 miles per hour or better under favorable conditions.

### TIRES SHOULD BE ALIKE IN SIZE If One Rear Tire Is Larger than the Other

#### Trouble Will Result

CHICAGO—Editor Motor Age—What harm or injury to the differential tires, or mechanism, would result by using a 36 by 4½-inch tire on one rear wheel and a 37 by 5 on the other? Would not the differentials regulate the difference of size and equalize the pulling strain? If put on the front wheels, would it have any other effect on the engine or car than to make awkward steering?

2—Does the lubricating value of oil ever diminish after giving miles of service, that is, if old dirty oil is filtered and allowed to stand until clear, can it be used over again?

3—Is there any method by which one can tell what horsepower is being used while the car is moving?—Robert N. Chatain.

1—If unequal size tires are used in the rear there will be excess wear on the differential gears for the reason that the differential will tend to be in action at all times. The 36-inch wheel has a circumference of about 113 inches and the 37-inch tire about 116 inches, hence when the former wheel travels 113 inches the latter must travel 116, which brings the differential into play. If the front tires are not alike it would make steering hard and perhaps cause uneven wear on the tires. If the wheel operating the speedometer mechanism is equipped with a different size tire the speedometer will not register correctly.

2—The value of the oil as a lubricant diminishes as it is used. When in the motor, the oil undergoes decomposition and after considerable use is unfit further as a lubricant. It is a difficult matter to strain oil and remove all the solid impurities.

3—There is no way of telling the power of the engine except if you know its horsepower at various r.p.m. A tachometer may be fitted so as to be read from the driver's seat and then if you know the horsepower at 1,000 r.p.m., 500 r.p.m., etc., you can tell approximately its horsepower at other speeds. Many race drivers use tachometers instead of speedometers for registering speed.

#### Plan for a City Garage

LOCK HAVEN, Pa.—Editor Motor Age—Kindly suggest a plan for a city garage having the most convenient and profitable arrangement for the following departments: An office and accessory salesroom; apparatus for handling to the best advantage gasoline and oil; general repair shop having besides the ordinary tools, lathe, drill press, forge, anvil; paint shop; storage room.

2—Does Motor Age know of any good garage opportunities in southern New York, Pennsylvania, or Ohio, either equipped plants for rent or sale, or locations where plants may be profitably located?—J. Milton Lord.

1—The illustration in Fig. 2 is the

floor plan of a city garage showing good arrangement of the departments you mention.

2—The classified columns in Motor Age should be of value to you. Perhaps some readers of Motor Age know of such opportunities.

**HAS TROUBLE WITH GENERATOR**  
**Regulation Is Poor—Probable Open Circuit Between Dynamo and Battery**

Fellows, Kern Co., Cal.—Editor Motor Age—I have a Michigan 40 1913 model equipped with a Northeast electric starter. I have had considerable trouble with this system in that there is not enough power to turn the engine over, hence the starter does not do the work, and the lights go down unless the car is being run fast. The storage battery has been overhauled recently. The battery was said to be in good condition when replaced on the car, but in two or three days I had the same trouble, no light on one side and starter too weak to crank the car. It was then brought to another repairman who said the same thing was wrong. He cut down the commutator segments. This gave light for a longer time, but it has the same trouble again.—A Subscriber.

It appears that poor regulation may be the cause of your trouble. The battery is not properly charged and hence the lights burn dimly and the cranking motor does not act well. The wiring between the battery and generator may have been disturbed resulting in broken insulation or a periodic open circuit. Motor Age suggests that you take this matter up with the Northeast company and it appears to have been unwise to allow an ordinary repairman to alter the construction of the generator.

**Attaching Cadillac Cylinder Head**

College Point, L. I.—How are the cylinder heads fastened down on the 1914 Cadillac?—John Hastings.

The head or portion containing the combustion chamber is fastened to the cylinder by means of a right and left threaded nipple. First the copper water jacket is placed on the cylinder. It is fastened at the bottom by means of a ring which when heated expands sufficiently to be forced over the water jacket and when cold contracts enough to make a perfect fit. The head is next attached to the cylinder.

**INCREASING THE CAR SPEED**  
**Instructions for Tuning Motor—Body Suggestions**

Memphis, Tenn.—Editor Motor Age—Would appreciate details as to how to get more speed out of a 1910 Chalmers 30.

2—How should a racing cam for this car be made to hold the intake valves open longer, or to open and close quicker?

3—Do these auxiliary air valves help the speed any?—Memphis Garage Co.

First decrease the weight of the vehicle as much as possible, removing all unnecessary, that is, non-essential, equipment. Since wind resistance is a great factor in reducing speed, it becomes evident that every effort should be made to streamline the car. A long tapering hood coming almost to a point, as in some racing cars, is good. Just enough space should be left in front to allow air currents to reach the radiator. It is considered more important to care for the rear of the car than it is to look after the front.

After the parts have been streamlined as much as possible the mechanical end should be considered. If possible, the

valve seats should be increased in size and new and larger valves obtained. If only the intake valves can be made larger, it is a good idea to do so. Increasing the size of the valve seats may be done with a counterbore, or an oversize valve reseating tool. New valves may be purchased at a comparatively low price. The lift of the valves may be increased slightly by substituting larger cams. Much will depend upon conditions as to just how the magneto shall be reset. Setting the magneto ahead will cause the motor to stop if the throttle is set down too far. If it is possible to use a larger carburetor and intake header it is best to do so, for if the intake valves are made larger more mixture can be accommodated. The frictional loss in the motor is reduced somewhat by removing one of the piston rings, but if the pistons have but two narrow rings this should not be done. Lighter pistons help matters materially. Some use magnesium, semi-steel or steel, while others take the old pistons and drill holes in them. Care should be taken in doing this work, that each piston weighs the same as any other piston. If possible use lighter connecting rods, but it would not do to remove metal from the old ones, for the strength may be impaired. New rods of stronger metal and thinner section, or hollow rods, are better.

One of the first essentials for a speedy car is to have a pressure oiling system with a hand control on the dash or other place within easy reach of the driver. This consists merely of a hand pump drawing oil from the tank and forcing it to the crankcase. Ball check valves properly placed can control the direction of flow.

In nearly all racing cars the motors are equipped with magnetos of the double-distributor type, so that they feed to two sets of spark plugs at the same time.

2—You can use a cam of similar design as the present one, but with a larger base circle. This will give quicker opening and closing.

3—Some of those on the market are helpful.

**Removing Franklin Shifter Lever**

Pittsburgh, Pa.—Editor Motor Age—I have a 1910 Franklin roadster. The clutch is badly worn and I am taking it out for repairs. In order to get the clutch out I have to remove the transmission, which is greatly worrying me. How can I remove the transmission shifter lever?—R. Smyth.

**Questions Answered and Communications Received**

L. R. French..... Hawarden, Ia.  
A Subscriber..... Brooklyn, N. Y.  
G. S. Brown..... Streator, Ill.  
Robert N. Chatain..... Chicago  
J. Milton Lord..... Lock Haven, Pa.  
A Subscriber..... Fellows, Cal.  
John Hastings..... College Point, L. I.  
Memphis Garage Co..... Memphis, Tenn.  
R. Smith..... Pittsburgh, Pa.  
K. A. Sedgwick..... Murdo, S. D.  
A Subscriber..... Oak Park, Ill.  
R. F. Stephens..... Toledo, O.

No communication not signed with the reader's full name and address will be answered.  
and...

In order to remove the lever and its shaft, first remove the wheel brake and shifter lever quadrants. The shifter lever then can be dropped down. Next remove the castellated nut N in Fig. 2 and loosen the set screw S. By taking hold of the shifter lever on the outside of the car it may be pulled out directly.

**CARBURETER ON HIS FORD LEAKS**  
**Gas-Logged Float or Improperly Seating Fuel Valve**

Toledo, Ill.—Editor Motor Age—What is the reason for tapping the springs on racing cars?

2—I have a 1913 Ford which has a Holly carburetor, which leaks very badly. Kindly tell me the cause.—R. F. Stephens.

1. To make the spring more stable and prevent it from breaking. It also gives easier riding according to many.

2. The leaking may be due to condensation in the intake manifold, a stuck or gas-logged float or an improperly seating fuel valve. Perhaps the line connection to the carburetor is not a good one. Don't try to repair the carburetor if you are not experienced.

**Corrects Statement to Reader**

Los Angeles, Cal.—Editor Motor Age—Referring to a communication in this department, issue of July 23, from John Hastings, of College Point, L. I., relative to rear wheels running in reverse motion when brakes are applied. A brake on the driveshaft or transmission would cause this to occur rather than a slipping brake as suggested in the answer to Mr. Hastings' inquiry.—R. S. Honeter.

**Timing Midland Valves**

Murdo, S. D.—Editor Motor Age—I have a Midland 40, 1910 model, and recently found that it was timed too slow. The gears were taken off and retimed. The valves do not seem to be timed right. This is a T-head motor.—K. A. Sedgwick.

Motor Age is unable to obtain the original valve timing of the Midland motor in your car, but the following valve timing will show good results in a motor of that type. The intake should open about 9 degrees past top center after the suction stroke and close 20 degrees after lower dead center of the suction stroke. The exhaust valve should open about 40 degrees before bottom dead center and close about 5 degrees past top dead center.

**Lapping-in Pistons**

Oak Park, Ill.—Editor Motor Age—Is it good practice or common to lap in pistons using ground glass or non-magnetic valve grinding compound?—A Subscriber.

It is the opinion of Motor Age that valve grinding compound is too coarse an abrasive for use in piston lapping. Ground glass mixed with a solution of kerosene and lubricating oil is better.

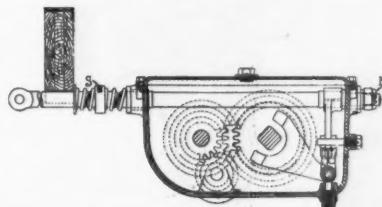
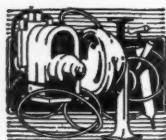


Fig. 2—In order to remove the shifter lever of a 1910 Franklin roadster the nut N must be taken out, the set screw S loosened and the brake and shifter quadrants removed



# The Accessory Corner



## Goodrich Rubber Bucket

A WATER bucket a motorist may put away in a small space is being marketed by the B. F. Goodrich Co., Akron, O. This bucket is made of rubber and has the feature that when filled with water it will rest upon the ground without collapsing. An added feature and one which will appeal to the motorist who has "run hot" and had to use a pail, is the strainer spout. This spout, as shown in Fig. 2, forms an easy means of pouring the water into the radiator and also acts as a strainer. The Goodrich bucket will hold 2½ gallons of water and can be folded up so as to occupy little room.

## Rimolox Tire Carrier

A new type of extra tire carrier has been brought out by the Rimolox Tire Carrier Co., Evansville, Ind., this carrier being designed for supporting tires attached to demountable rims. It consists of a three-arm bracket as shown in Fig. 3, the ends of the arms being fitted with cups which take hold of the entire inner surface of the rim. This carrier has no straps and is equipped with a locking device to prevent loss of the tire through theft. Unlocking the padlock in the center allows the tire to be removed. The Rimolox may be attached to either side of rear of the car.

## Double Rubber Inner Tube

A new type of inner tube has just been announced by the Double-Fabric Tire Co., Auburn, Ind., this tube consisting of six plies of rubber, alternating red and gray. This makes the tube rather thick and the maker states it is 25 per cent thicker than the ordinary tube. Each of the plies

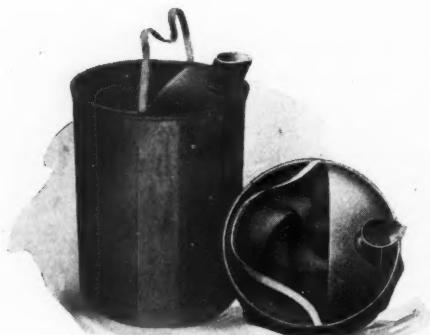


Fig. 2—A rubber water bucket of Goodrich make, which can be placed on the ground even if full. It can be collapsed as shown and then takes up little room

forming an inner tube in itself, should do much toward the prevention of slow leaks and the tube being thick should stand up under severe strains. The price of this tube is slightly higher than that of the ordinary type. The 30 by 3-inch size sells for \$3.65 and the 34 by 4 for \$6.40.

## Shanhause Motorsuit

Many motor car owners will appreciate the garage suit made by W. Shanhause & Sons, Rockford, Ill. and retailing at \$2. This suit, shown in Fig. 1, is similar to those used by racing car drivers while they are working about their cars. The suit is made of strong tan-colored material and covers the entire body.

## Liberty Warning Signal

An improved type of warning signal has been brought out by the Liberty Bell Co., Cleveland, O., this signal announcing the vehicle by a red light and the ringing of a bell. The bell is operated similarly as a house bell, by an electromagnet, as shown in Fig. 9. A small push button conveniently located sends cur-



Fig. 1—A one-piece garment called the Motorsuit, which garagemen and car owners will appreciate when work around the car is necessary

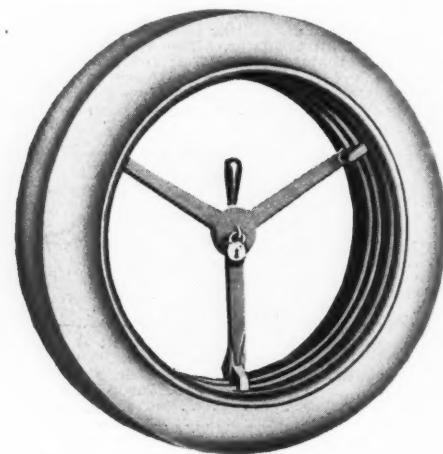


Fig. 3—An unusual form of extra tire carrier. This is called the Rimolox and is designed for supporting tires on demountable rims

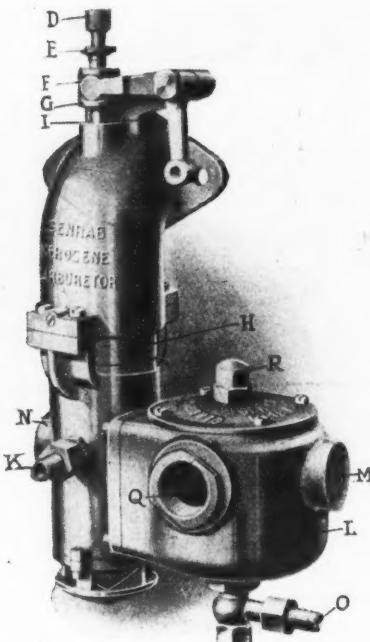


Fig. 4—Exterior view of the Senrab carburetor which uses exhaust gas as the heating agent

rent from either dry cell or storage battery through the electromagnet, thus operating the small ball which strikes the bell. The Liberty is made in two sizes, one of them being 5 inches high and 5 inches in diameter and selling at \$10, and the other 6 by 6 inches, selling at \$12. These prices do not include the light attachment and the respective prices for the bell with the light are \$12 and \$14.

## New Westinghouse Meters

A new line of 5-inch diameter, direct current, portable ammeters, voltmeters and millivolt meters, known as the type PW, has just been announced by the Westinghouse company, Pittsburgh.

These instruments, shown in Fig. 7, are direct reading and suitable for battery testing, signal work, and all purposes where an instrument of pocket size is desirable. They are particularly adapted to testing electric lighting and starting equipments. They operate on the D'Arsonval principle.

The complete movement is mounted as a unit. A unique feature is the arrangement of the moving element which can be removed readily by taking off the cover and removing the two screws on the side pole-piece support. The entire moving element and the bearings can then be lifted out as a unit. This makes repairing possible without disturbing the alignment of the magnetic circuit. Owing to the use of an aluminum pointer, a light counter-weight is sufficient, resulting in a light-weight movement and small wear on the pivot jewels. The light metal frame

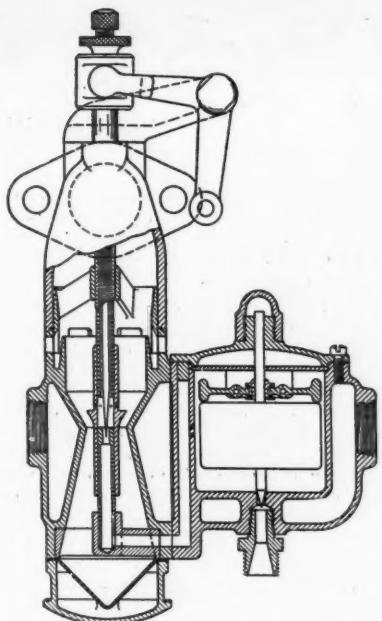


Fig. 5—Sectional view of the Senrab kerosene carbureter, the exterior view being shown in Fig. 4.

on which the moving coil is wound moves through the air-gap of a strong magnet and enables readings to be taken quickly, and prevents violent fluctuations from injuring the pointer or the moving element. Each meter is mounted in a morocco leather-covered wood case with heavy beveled glass over dials.

#### Grossman Terminals and Connectors

Dealers and garagemen will be interested in the latest product of the E. Grossman Co., Brooklyn, N. Y., which is in the form of an assortment box of cable terminals and battery connectors of every type in demand. Each style is in a separate compartment as shown in the illus.



Fig. 6—Display box of terminals and battery connectors brought out by the E. Grossman company. The illustrations inside the cover show how the terminals are used

tration in Fig. 6, and inside the box cover are illustrations showing how and where the different terminals are used. The size of the box is 10 by 10 by 1½ inches.

#### End-Oxy Piston Ring Clamp

Those who have attempted to fit a cylinder block, single cylinder or twin, over the pistons know that it is a difficult job unless someone compresses the rings to allow the cylinder to slide. In order to simplify this work the End-Oxy Appliance Co., Trenton, N. J., has brought out the piston ring clamp, shown in Fig. 8. This clamp fits around the rings and holds them in position while the cylinder is being slipped in place. This clamp consists of a webbed strap with a flat locking buckle at one end. To this buckle is attached a brass lining as shown in the illustration, the other end of the lining being free. The lining is sufficiently thin to enter the bevel or chamfer at the cylinder base and is too thick to wedge between the piston and cylinder wall. The clamps come in sizes to accommodate 3½ to 6-inch diameter pistons. The End-Oxy sells for \$1.

Another device manufactured by this concern is the Leektite piston ring, shown in Fig. 8, which is made of one piece of gray iron and depends for its qualities of preventing leakage of gas and oil past the piston upon the formation of the ring ends. These, as the illustration shows, form a joint through which no mixture can escape, it is claimed. The price of these rings is \$1.50 each for any size from 3½ to 5 inches.

#### Senrab Carbureter

A new type of kerosene carbureter is being manufactured by the Senrab Carbureter Co., Sea Cliff, L. I., the instrument utilizing exhaust gas as a heating agent and feeding initially a mixture of gasoline and air. The vaporization of the fuel is aided in this device, by passing some exhaust gas into a jacket which surrounds the float chamber and venturi tube. A feature of the Senrab is that the adjustment of a single moving part affects the fuel supply and two air supplies giving the proper proportions of fuel and air at all times, it is claimed. The carbureter, shown in Figs. 4 and 5, is of unusual

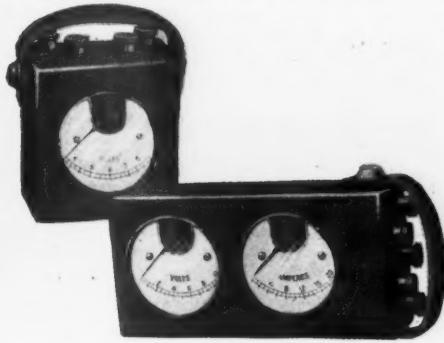


Fig. 7—New types of Westinghouse voltmeters and ammeters. These instruments are especially adapted for testing electric lighting and starting equipments



Fig. 8—The End-Oxy piston ring clamp is shown above. This device makes it easy to set a cylinder in place over the piston. The joint of the Leektite piston ring is shown below

appearance. The float chamber L has the opening M through which exhaust gas enters the float jacket. The gas passes out at N. The kerosene inlet is at O and the gasoline intake at K. Suitable means are provided for changing from one fuel to the other, it being said that a few minutes operation on gasoline is sufficient. The float fuel level may be seen through the window Q. A lean mixture is obtained by loosening the nut E and screwing down the needle-valve end D and for a rich mixture the collar F is moved higher on its stem. The movable portion H is the auxiliary control and the float adjustment is at R.

It is stated that after the initial adjustment of the parts mentioned no further adjustment is necessary. The prices of the Senrab carbureter range from \$15 for the ¾-inch size to \$60 for the 4-inch size.



Fig. 9—Liberty Bell warning signal which flashes a light and rings a bell to warn pedestrians and drivers of the approach of the vehicle

# From the Four Winds

**BILLINGS** Schedules Motor Show—Under the auspices of the chamber of commerce, Billings, Mont., will hold a motor show on September 15, 16 and 17.

**Spends \$2,000,000 for Motor Cars**—Wilkes-Barre, Pa., a city of 67,105 inhabitants, has spent approximately \$2,000,000 for motor cars this season, according to figures compiled by the chamber of commerce. The dealers of the city have sold 818 cars since the beginning of the year.

**Hill-Climb at Rockford, Ill.**—The annual hill climb arranged by the Rockford Motor Club, took place on Kennedys hill near Rockford, Ill., August 5. Silver cups and other premiums were given to the owners of cars making the best showing. A. E. Koch, president of the Rockford club, had charge of the competition.

**Raise Funds to Punish Law-Breakers**—Believing that the increase in the number of motor car accidents in Indianapolis is the result of careless driving and an utter disregard for the laws of the road, the Hoosier Motor Club has raised money to hire a special prosecutor to bring about the punishment of motor car owners and chauffeurs who are found criminally careless.

**Entire Town Can Go Motoring**—Campbell, Minn., with 345 inhabitants, has enough motor cars to take every man, woman and child riding at one time. As compared with one town in the state which has not a single machine, Campbell has thirty-eight cars. The place is the southern gateway to the Red River valley which accounts for the prosperity. The valley is the bread basket of the world.

**Salem Show in September**—One of the first motor shows of the 1915 season will take place at Salem, N. H., during the first week in September when Chester I. Campbell, manager of all the Boston shows, will take charge of a big section set aside at Rockingham park that week where dealers in Boston, Lowell, Lawrence, Haverhill, Nashua, Manchester and other New England cities will have a chance to exhibit their new models.

**Motorists Form Risk Company**—Claiming that the rates of the state and national companies are too high, motor car fire insurance companies, composed of home patrons only, are being organized in the various cities of Illinois. Car owners of Dixon organized such a company last week to be known as the Automobile Fire Insurance Exchange. "Home company under local management" is the slogan adopted. Officers were chosen as follows: President, O. H. Martin; secretary, H. V. Baldwin; general manager, V. C. Bosworth, all of Dixon. It is asserted that the home company can offer rates much less than the state and national concerns.

**Iowa's Cars Total 99,700**—Beginning August 1, the motor car license fee in Iowa was reduced one-half for the rest of the year. This is the first application of the new law. Few owners waited for the bargain rate though there was a small "bargain counter" rush soon after the new rates went into effect. Predictions for the registration of 100,000 cars in the state by August 1 were practically fulfilled, the number on record at the close of business on July 31 being 99,700. The state collected approximately \$1,000,000 in license fees for the fiscal year ending July 31. Division among the counties of the fees collected between April 1 and August 1 now is being made. The sum on hand is about \$250,000 and each county re-

ceives \$151.88 for each township within its borders. The number of counties is ninety-nine and the average number of townships to the county is about twenty.

**Drivers for State Fair Races**—Several well-known race stars have been secured for the races to be held at the Minnesota state fair, on the Hamline 1-mile dirt track September 12. Prizes aggregate \$1,500.

**Young Drivers to Race at Tacoma**—Junior racing cars from Los Angeles will race on the new Tacoma speedway Labor day. After the races at San Bernardino, Cal., August 9 the small cars will be shipped to Tacoma. Al Henzel will pilot the Benz; Ernest Johnson, the Maxwell; Allen Bruce, the National; William Wenthoff, the Mercer, and Homer Loudenclos, the Stutz.

**Special Truck to Mark Roads**—A Moreland truck, manufactured in Los Angeles, will be used to carry the highway signs which are being sent out by the Automobile Club of Southern California. The truck will go across the continent to mark the roads to Los Angeles. The Moreland which will be used by the club will be painted a glistening white and will be constructed with a double deck. On the upper deck will be the sleeping quarters of the crew engaged in the work, and below will be carried the signs and posts. These will be shipped from Los Angeles and picked up along the Santa Fe route. Their total weight is 47 tons. The first sign will be set up in Los Angeles and a bottle of California wine will be broken

over the top of the big metal marker. On the part of the motor club, President Fred L. Baker will dedicate the \$24,000 signing system to Los Angeles and to the National Old Trails Association.

**Yellow Tags for Californians**—In honor of the Panama-Pacific exhibition, the state board of control has decided upon the color of the California golden poppy for the motor car number plates during 1915. The numbering and lettering will be black. The state treasury will be drawn upon next month for approximately \$600,000, representing the net one-half of the license receipts. Under the law this division of the money will be distributed among the various counties for highway construction.

**Los Angeles Has 2,800 Trucks**—Twenty-eight hundred motor trucks, representing a valuation of more than \$5,000,000 are in daily use on the streets of Los Angeles. These commercial vehicles have displaced more than 12,000 horses, increasing efficiency in freight transportation and making Los Angeles a cleaner city. Truck experts estimate that there are hauled daily by the entire truck fleet of Los Angeles more than 6,000 tons. This high tonnage figure is brought up by the immense amount of dirt hauling done by contractors.

**To Punish Road Marker Vandals**—Iowa, like Illinois, is having more or less trouble with rival road organizations defacing each others' route markers. Direction arrows have been reported taken down and turned about so that the direction is misleading, and worse than none at all. Other road signs have been torn down entirely or partially covered up with advertising matter or rival road signs. Persons who destroy, mutilate or deface road markers are liable to a fine of \$100 and 30 days in jail. This point is covered explicitly in section five, chapter 125, of the new Iowa road law.

**Need Not Pay Chauffeur's Fee**—Decatur, Ill., has won a tilt with Secretary of State Harry Woods regarding the collection of license fees from drivers of the city fire and police motor trucks. The city refused to pay this fee, claiming that the drivers were in the service of the public and that the rigs they drove were not operated for hire. The secretary of state, after considering the question, decided this week that the city was in the right and that the chauffeurs' fees could be waived. The state officer insisted that the city pay the license fee for machines however, and a test case may be made of this. This decision will exempt all municipal employees in Illinois from paying the chauffeurs' examination fee.

**Much Interest in Road Congress**—State highway officials from fully three-fourths of the states which have state highway departments will meet to discuss questions of mutual interest at the fourth American road congress, to be held in Atlanta during the week of November 9. State Highway Engineer Fletcher of California, who is a director of the American Highway Association, the parent organization in the meeting, has been elected president of the congress and will preside at the opening session. State Highway Commissioner Carlisle of New York is chairman of the program committee and Director Logan Waller Page of the U. S. office of public roads, will take a prominent part in the proceedings, as president of the American Highway Association. Among the most important subjects to be discussed will be systematic road management, in-

## Coming Motor Events

### SHOWS AND CONVENTIONS

September 9-11—Convention of National Paving Brick Manufacturers' Association, Buffalo, N. Y.  
 September 7—Indianapolis show.  
 October 5-10—Fall show, St. Louis.  
 October 7-17—Electric vehicle show, Grand Central Palace, New York.  
 October 17-24—Show, Pittsburgh, Pa.  
 October 19-21—Convention of Electric Vehicle Association of America, Philadelphia.  
 November 9-14—American Road Congress, Atlanta, Ga.  
 January 2-9—New York show.  
 January 9-16—Philadelphia show.  
 January 23-30—Chicago show.

### CONTESTS

\*August 21-22—Road races, Elgin, Ill.  
 September 5—Track meet, Milwaukee, Wis.  
 September 7—Track meet, Providence, R. I.  
 September 9—Road race, Corona Beach, Cal.  
 \*September 12—Track meet, Hamline, Minn.  
 September 14—Track meet, Milwaukee, Wis.  
 September 15-16—Track meet, Norfolk, Neb.  
 September 18-19—Track meet, Hutchinson, Kans.  
 September 18-26—Track meet, Springfield, Ill.  
 October 2-3—Track meet, Oklahoma City, Okla.  
 October 2-3—Track meet, Trenton, N. J.  
 November 8-11—Track meet, Shreveport, La.  
 November 15—Kerosene motor tests, Paris, France.  
 November—El Paso-Phoenix road race.  
 November—Los Angeles-Phoenix road race.  
 November—Albuquerque-Phoenix road race.  
 November—Track meet, Phoenix, Ariz.

\*Sanctioned by A. A. A.

volving the organization of working forces and the methods of reporting and recording work, which will be presented by Charles J. Bennett, state highway commissioner of Connecticut.

**Drivers Under 15 Years Barred**—Children under 15 years of age will not be permitted to operate motor cars in Iowa unless accompanied by their parents or guardians. This is the ruling this week of C. A. Robbins, assistant attorney general, as the result of a dispute arising in Eldora. A conflict in the law obscured its meaning. Mr. Robbins holds that the youngsters cannot take out cars for their personal use unless the parents are in the car.

**Plan Lincoln Highway Connection**—At an enthusiastic meeting of good roads advocates held at Tipton, Ind., last week, the Central Indiana Lincoln Highway Association was permanently organized to promote the building of a connecting link between Indianapolis and the Lincoln highway which crosses the northern part of the state. The following officers were elected: President, Hugh McCaffery, president of the chamber of commerce, Kokomo; vice-presidents, O. C. Smith, Kokomo, J. R. Nash, Tipton, Isaac Wells, Rochester, John W. Parkhurst, Peru, and Marion Jessup, Noblesville.

**Battle Over Lincoln Way Signs**—It has been decided to make a test case of the right to use the Lincoln highway signs. In Sterling, Ill., Alderman W. J. Doherty placed the signs on certain streets in Sterling, although the association selected another route. State Consul J. W. Corkings removed the signs after they had been installed by the alderman but the latter disputes the right of Mr. Corkings to disturb the signs and will take the case into court. The Lincoln Highway Association announces that the Lincoln highway markers are copyrighted and that the signs cannot be legally used for any purpose than to mark the highway as laid out by the association. It is further announced that the route of the highway can not be changed without the permission of the officers at the head of the organization.

**Governor in Guide Post Campaign**—In his travels throughout the state of which he is the chief executive, Governor Simeon E. Baldwin of Connecticut has noted the absence of guide posts at various "four corners." He has sent a letter to the selectmen of the various towns calling their attention to the law governing sign boards and pointing out that each offense is subject to a fine of \$5. In his communication to the selectmen, Governor Baldwin says, "My business calls me about the state in different quarters and I have frequently noted the absence of guide posts where this statute calls for them. They are peculiarly important in these days of motor traveling far from one's home. We wish to make Connecticut a favorite resort for motorists of other states. Plenty of guide posts would help materially toward this end."

**To Build Arch Over Big Sioux**—Sioux City is to build a great concrete arch bridge over the Big Sioux river. It has asked the Iowa state highway commission to prepare her plans for a suitable structure. Sioux City, it is understood, stands ready to pay two-thirds of the total cost of the bridge. Union county, South Dakota, being expected to pay the other third. The preliminary survey of the bridge site has already been made by Field Engineer Fred White, who has suggested five 80-foot open spandrel concrete arches, making a bridge 400 feet long. The roadway planned is 30 feet, with two 5-foot sidewalks, 40 feet in all. The old bridge is 520 feet long, consisting of two 260-foot combination wooden trusses. On the South Dakota side there is at present a new 152-foot steel span approach. The old bridge as a whole is in rather poor condition. The

bridge will be located on the Bix Sioux near the Sioux City Yacht Club, a sightly spot, and an important approach to the city, and the route leading to the speedway.

**Again the Horse Capitulates**—That motor cars are supplanting horses in Will county, Ill., was indicated by the board of review figures. These show that there are 1,341 fewer horses in the county at the present time than a year ago with a decrease in valuation of \$99,000.

**Drives Backward; Sanity Questioned**—Is a man sane who runs a motor car backwards through city streets at breakneck speed? This question soon will be up to the commissioners of insanity in Des Moines in the case of C. J. Lindstrom. It is alleged that he put the car in reverse and proceeded to joyride through the city streets backwards. He is in custody and the commissioners will pass upon his sanity.

**Plan Return Sociability Run**—Plans for an official sociability tour from the Gulf of Mexico to Colorado next summer, in return for the official tour of Colorado motorists to the gulf this summer, were made at the convention of the Colorado-to-the-Gulf Highway Association last week in Colorado Springs. Valuable improvement work along this new north-and-south route was reported, plans were outlined for further development and a commission was appointed to secure federal recognition and assistance.

**Miniature Ford Plant at State Fair**—One of the features of the Michigan state fair, which will be held on the fair grounds, near Detroit, September 7 to 18, will be a miniature Ford Motor Co. plant in full operation. The Ford company has hired all of one side and half of the other side of the large exhibition building for that purpose and will start at once installing machinery and operating a replica of the big Ford plant. Between 100 and 200 men will be employed and will work on a schedule to turn out 25 cars daily. Arrangements will be made so that one may follow the manufacturing process by seeing the material come in at one end of

## Recent Incorporations

**Boston, Mass.**—Bostonia Motor Mfg. Co., capital stock, \$200,000; to manufacture motor cars.

**Boston, Mass.**—Mohawk Motor Co., capital stock, \$40,000; incorporators, C. E. Bosworth, H. E. Fullam.

**Boston, Mass.**—Chalmers Motor Co., capital stock, \$100,000; incorporators, J. J. Murray, J. L. Hermanson, E. Leitiger.

**Boston, Mass.**—Oxford Co., capital stock, \$50,000; incorporators, W. K. Stafford, Sylvanus T. LeBaron, D. L. Oulton.

**Brooklyn, N. Y.**—Ellenbeck Tire & Supply Co., capital stock, \$5,000; to manufacture, deal in and repair tires; incorporators, E. H. Wilkinson, E. E. Wilkinson.

**Buffalo, N. Y.**—Meinhard Auto Service-Specialties-Sundries-Supply Co., capital stock, \$10,000; incorporators, T. P. Meinhard, C. H. Meinhard, C. J. Staples.

**Cleveland, O.**—Fenfar Co., capital stock, \$10,000; to manufacture parts; incorporators, E. W. Farr, C. W. Fenner, F. J. Breeler, O. Gutemann, W. E. Ward, G. A. Ehret.

**Detroit, Mich.**—Detroit Starter Co., capital stock, \$20,000; to manufacture starters; incorporators, A. B. Porter, J. W. Fitzgerald, F. J. Lamb.

**Detroit, Mich.**—Central Oil Co., capital stock, \$200,000; to deal in gasoline; incorporators, R. F. Francis, O. D. Zoller, R. J. Morrison, E. C. Hoffman.

**Detroit, Mich.**—General Garage Co., capital stock, \$6,000; incorporators, J. Frank, F. D. Boydell, J. G. Wood, B. N. B. Wood.

**Detroit, Mich.**—Home Service Co., capital stock, \$1,200; to deal in supplies; incorporators, R. C. Simon, L. Diebel, J. B. Dale.

**Detroit, Mich.**—Spranger Rim & Wheel Co., capital stock, \$100,000; to make motor car rims and wheels; incorporators, N. M. Spranger, F. Spranger, C. B. Dettmer.

**Eopus, N. Y.**—Kronenberg's 77th Street Garage, capital stock, \$1,000; incorporators, H. Weinstein, B. Kronenberg, B. Kronenberg.

**Flint, Mich.**—Monroe Motor Co., capital stock, \$125,000.

the building and the complete car come out at the other end. In another part of the building the Ford moving pictures will be shown.

**More Money for Ohio Roads**—The Ohio highway commission August 4 awarded road improvement contracts in the Buckeye state amounting to \$2,629,000, which call for the construction of 178 miles of highways in almost every county of the state. A large part of the work is to be done during the present season.

**Blue and Gold Tags for Connecticut**—The first consignment of 1915 state motor car tags has been received by the secretary of state of Connecticut. The scheme for next year is gold letters on a blue background. The entire allotment will soon be in possession of the secretary of state so that no delay will result in the issuance of new licenses the first of the new year.

**To Mark Funeral Cars**—A black cross on a white background 5 inches square is the officially-adopted insignia which will be placed on all cars in a funeral procession in Pittsburgh in order that they may be recognized and the line may not be interrupted by traffic. Action to this effect was taken by the police bureau at the request of the Allegheny County Funeral Directors' Association, which complained that funerals were interrupted at street crossings.

**New Motor Road in Southwest**—The Carlsbad-Palins Good Roads Association is constructing an exclusive motor highway in New Mexico between Carlsbad and Livingston, 75 miles, which when finished, will shorten the distance between the two places 35 miles as compared with the existing road over the rough Capitan mountains. The new highway will be a connecting link in the all-motor road between San Angelo, Tex., and El Paso, a distance of more than 300 miles. An exclusive motor road already runs between Carlsbad and San Angelo. C. T. Adams, a wealthy sheep man of Carlsbad, is president of the Carlsbad-Palins Good Roads Association.

**Greenwich, Conn.**—Allen Brothers Garage, capital stock, \$50,000.

**Hartford, Conn.**—Overland Connecticut Co., capital stock, \$20,000; motor car business; incorporators, A. C. Hine, H. C. Hine, E. W. Humphrey.

**Kalamazoo, Mich.**—Safety Fire Motor Car Co., capital stock, \$10,000.

**Louisville, Ky.**—Peerless Tire & Rubber Co., capital stock, \$10,000; incorporators, A. F. Wolke, C. H. Wolke, K. L. Bullitt.

**Madison, Wis.**—Star Tire & Rubber Co., capital stock, \$5,000; to manufacture and deal in tires; incorporators, J. W. Mort, C. E. Mort, M. M. Mort.

**Milwaukee, Wis.**—Regal Motor Co., capital stock, \$5,000; to deal in motor cars; incorporators, D. Wittenberg, H. E. Legg, N. M. Wittenberg.

**Milwaukee, Wis.**—L-Arrow Auto Livery Co., capital stock, \$10,000; to operate taxicab and livery business; incorporators, C. H. Ewe, W. F. Albers, C. W. Modersohn.

**New Rochelle, N. Y.**—C. B. A. Sales Corp., capital stock, \$3,000; motor car business; incorporators, S. H. Kent, Wm. H. Schumacher, M. J. Murphy.

**New York**—Pickens Auto Cloth Co., capital stock, \$1,000; incorporators, S. A. Pickens, J. W. Pickens, B. Simon.

**New York**—Ventre & Ostruk Co., capital stock, \$1,000; motor car business; incorporators, H. Ventre, P. Ostruk, J. Schlesinger.

**New York**—Canada Carbide Sales Co., capital stock, \$10,000; incorporators, H. J. Fuller, D. W. Dunn, W. L. Bush.

**Philadelphia, Pa.**—Interstate Sales Co., capital stock, \$25,000; to manufacture and deal in motor cars; incorporators, W. C. Arnold, H. C. Lansinger.

**South Orange, N. J.**—Robinson Seitz Tire Co., capital stock, \$5,000; to manufacture tires; incorporators, G. W. Robinson, A. M. Seitz, F. Robinson.

**Utica, N. Y.**—Utica Garage Co., capital stock, \$1,500; incorporators, P. Bartmer, P. T. Higgs, B. H. Dwinell.

**Wilmington, Del.**—Knotts Taxicab Co., capital stock, \$25,000; incorporators, E. Krause, J. W. Brady, J. Knotts.

**Winnipeg, Can.**—Canadian Bull Tractor Co., capital stock, \$1,000,000; to manufacture trucks; incorporators, W. H. McWilliams, A. R. Argraft, J. S. Loudon, W. J. Cummings, R. M. Wolbin, W. Pace, L. A. Cannon, H. F. Williams.

**Yonkers, N. Y.**—Foster Motor Sales Co., capital stock, \$3,000; incorporators, G. B. Foster, M. E. Foster, J. Bertram Foster.



# Among the Makers and Dealers



**FIELDS Joins Chalmers Forces**—The Chalmers Motor Co. has appointed Joseph Fields, formerly of Fargo, N. D., assistant sales manager of its Detroit plant.

**Tuckerbury With Puritan Company**—The Puritan Mfg. Co., Detroit, has appointed W. W. Tuckerbury, formerly of the Metal Products Co., assistant general manager.

**Heavy Increase in Cole July Sales**—According to President Cole of the Cole Motor Car Co., the July sales for 1914 showed an increase of 150 per cent over those of July, 1913.

**Cleveland Firm in M. and A. M.**—The National Screw and Track Co., maker of screws, bolts, rivets, nuts, spokes, etc., has been elected to membership in the Motor and Accessory Manufacturers.

**Moving to Battle Creek**—The Michigan Brass and Foundry Co., which was purchased recently by capitalists of Battle Creek, Mich., is now being moved from Detroit to the latter city.

**Auction Sales of Used Cars**—The Claypool Garage Co., Indianapolis, one of the largest in the city, will start a monthly auction sale of second-hand cars beginning August 8. The company is advertising that it will purchase for cash second-hand cars and also will sell any car which owners may want to have sold, on a commission basis.

**Body Company Adds to Plant**—A five-story building, located at Forrest and Grandy avenues, Detroit, has been acquired by the Fisher Closed Body Co. and the Fisher Body Co., which are both under the same management. This will give the concerns about 100,000 square feet of additional floor space and enable them to employ about 600 more men.

**Plan to Refinance U. S. L. Co.**—Plans are under way for the refinancing of the United States Light and Heating Co., Niagara Falls, N. Y., which recently was placed in the hands of receivers in equity. A. H. Ackerman, vice-president and general manager prior to the receivership, has been made general manager under the receivership. Assets are said to be three times the liabilities.

**Selling Stock for Adams Bros Co.**—Merchants of Findlay, O., are trying to sell \$25,000 worth of stock for the Adams Bros. Co., motor truck maker, to put the business on a better financial basis, floods and the strike of 1 year ago having placed it in the hands of a receiver. If this is accomplished, a well-known truck manufacturer will place \$10,000 in the concern and become the manager, it is claimed.

**Drawback on Bodies Allowed**—A drawback allowance has been granted by the treasury department on the exportation of motor cars and bodies manufactured by J. M. Quinby & Co., Newark, N. J., with the use of imported chassis, aluminum, hardware, metal fittings, plate glass, woolen carriage cloth, various kinds of laces, carpet, waterproofed fabrics for tops, leather, metal chains, rubber tires and other fabrics and materials.

**Northwestern Dealers to Meet**—Northwestern motor car dealers will gather in Minneapolis September 10-11 for the first annual meeting of the Retail Auto Dealers' Association, formerly the Minnesota Retail Auto Dealers' Association. The organization now includes also dealers from the Dakotas, Montana, northern Iowa and western Wisconsin. The delegates will be on hand during state fair week and will take part in a

parade. Each dealer will decorate the car in which he rides overland to attend the meeting.

**Rate on Axles Too High**—The interstate commerce commission has decided that the charging of \$3 a hundred pounds on motor car axles from Detroit to Los Angeles, Cal., is an unreasonable freight rate.

**Argo Vacates New York Office**—The New York office of the Argo Motor Co., Inc., at 7 East Forty-second street, was discontinued August 1 and the executive offices of the company are now at Jackson, Mich., where the factory is located.

**Regal Selects Canadian Site**—The Regal Motor Car Co., Detroit, Mich., has selected Berlin, Ont., as the site of its Canadian plant and is now rushing work on a factory there which will be completed late this month. R. P. Henderson has been appointed sales and advertising manager of the Canadian factory and Henry Nyberg will be in charge of the production.

**Mitchell-Lewis Floats Loan**—H. L. MacClaren, president and general manager of the Mitchell-Lewis Motor Co., Racine, Wis., announces that the company, through its comptroller, Martin J. Gillen, has negotiated a loan of \$700,000 on a 5-year basis to take care of its current needs and that the financial position of the company is now the strongest in its history.

**Studebaker Reports Prosperity**—The Studebaker Corp., of Detroit, Mich., and South Bend, Ind., makes the following announcement through A. R. Erskine, first vice-president and treasurer: The Studebaker Corp. reports \$3,027,844.48 net profits for the 6 months from January 1, 1914, to June 30, 1914; reduction in liabilities of \$2,216,317.06, and a cash balance of \$3,228,654.29.

**Sterling Company to Build Light Cars**—The Sterling Motor Car Co., of Brockton, Mass., successor to the Sterling Motor Co., announces that it will begin at once the construction of 1,000 motor cars to retail, fully equipped at \$650. The company has a plant on Centre street, near Quincy, and states that 500 men will be put to work immediately. Its output for the 1915 season will be at least 5,000 cars, according to the officials of the company.

**Agent Sues Norwalk Company**—The Norwalk Motor Car Co. of New York has brought suit in the United States district court in New York asking that the Norwalk Motor Car Co., of Martinsburg, Va., be restrained from shipping Norwalk cars into New York territory. The New York company had a distributor's contract which the manufacturer determined to terminate because of alleged violations of the agreement. The case will be heard September 8.

**Ford Enlarging Canadian Plant**—A \$300,000 addition to the Ford Motor Co.'s plant at Ford City, Ont., will be erected at once, the new section to replace the only remaining old buildings now known as the "old wagon works." The new building will be six stories high and 200 feet square. It will be of reinforced concrete, of the same design as the main building of the plant. Between 400 and 500 men will be employed when it is completed, according to General Manager Gordon M. McGregor and the floor space of the plant will be increased nearly 50 per cent. The company is at present building assembling factories in Toronto and Ford City and will start another in London, Ont.,

before the fall. These plants will have a capacity of twenty-five cars a day each, and the Ford City plant will supply them with finished parts.

**Organizes Kickhaefer Mfg. Co.**—Edward A. Kickhaefer of Milwaukee has organized the Kickhaefer Mfg. Co. and established a shop for the production of dies and stampings at 199-201 Clinton street.

**Willard to Enlarge Plant**—The Willard Storage Battery Co., Cleveland, will start soon the erection of a large \$35,000 plant on East One Hundredth and Thirty-first street. The building will be 200 by 135 feet and one story high.

**Reorganize Dart Mfg. Co.**—The Dart Mfg. Co., Waterloo, Ia., has been reorganized as the Dart Motor Truck Co. It has been arranged to sell preferred stock to the amount of the assets of the old company. There is additional paid in capitalization of \$85,000.

**Addition to Gramm-Bernstein Plant**—The Gramm-Bernstein Mfg. Co., of Lima, O., maker of motor trucks, will start soon the erection of a large addition to its factory. B. A. Gramm, general manager, says the work will be rushed to completion some time in September.

**Overland Agent Offers Rebate**—The C. T. Silver Motor Co., New York, like the Ford Motor Co., has inaugurated a conditional price reduction plan in connection with its 1915 sale of Overlands. If the sales by August 1, 1915, total 2,500 cars, \$50 will be rebated to each buyer and a further rebate will be made if the sales reach 3,000. This will entail a disbursement of about \$125,000.

**Weed Enjoins Indianapolis Dealer**—George F. Kreitlein, doing business under the name of the Guarantee Tire and Rubber Co., Indianapolis, has been permanently enjoined by Judge Francis E. Baker of the United States district court from infringing patents on a tire grip of which the Weed Chain Grip Co. is the licensee and the Parsons Non-Skid Co., Ltd., a British company, is the holder of the patents.

**Ford Secures More Land for Branch**—The Ford Motor Co. has bought two lots for an addition to its ten-story building at Fifth avenue N and Fifth street, Minneapolis, which is not yet completed. The additional space gives the company an entire square of land and will enable it to double the size of its \$750,000 assembling plant. The lots cost \$37,950. For the present the land will be utilized for a side track.

**Cyclecar Company Leases Grout Plant**—The old plant at Orange, Mass., used for many years by the Grout Automobile Co. for manufacturing Grout cars, has just been leased by the Orange National Bank, its owner, to a syndicate that proposes to form a corporation that will build light trucks and cyclecars. The factory has been leased for a term of years with an option to purchase the place at the expiration of this period.

**Goodrich Semi-Annual Profits \$2,651,278**—According to officials of the B. F. Goodrich Co., the net profits of the concern for the 6 months' period ending June 30 amounted to approximately \$2,651,278. This amount, added to the surplus carried over December 31, 1913, shows undivided profits of \$2,307,261 after deducting the regular April and July dividends on the preferred stock. From this amount the company has appropriated a sum sufficient to retire \$900,000 par value of preferred stock.



# Brief Business Announcements



**TORONTO, Can.**—Dodge Bros., Detroit, has appointed E. P. Clarkson as district representative for this territory.

**Hartford, Conn.**—William M. Apperson, J. M. shock absorber distributor in this territory, has taken on the agency for the Never Skid truck equipment.

**Painesville, O.**—Jack LaFournier, formerly connected with the Vulcan Mfg. Co., will manage a new garage and repair shop being erected at the corner of State and Erie streets.

**Easthampton, Mass.**—Harry W. Stone, proprietor of the Easthampton Auto Co., filed a voluntary petition in bankruptcy last week. His assets are about \$400 with liabilities between \$800 and \$900.

**Indianapolis, Ind.**—A. T. Mosher, formerly head of the wholesale department of the Nordyke & Marmon Co., has become state representative for the Chalmers Auto Co., distributor in Indiana for the Chalmers and Peerless.

**Iron River, Mich.**—R. A. Thorin and L. H. Mylander of Iron River, Mich., have formed a partnership under the style of Iron River Motor Car Co. and established a garage and repair shop at 312 East Genesee street. The firm will conduct a livery in conjunction with the agency, storage and repair business.

**Columbus, O.**—The Livingston-Hinkle Rubber Co. is the name of a new tire agency located at 186 East Gay street, Columbus. The company will specialize on Mohawk tires, but will handle all makes. The concern is composed of D. E. Livingston, formerly manager of the Columbus

branch of the B. F. Goodrich Co., and H. L. Hinkle.

**Brockton, Mass.**—Elbridge W. Anderson, of Brockton, Mass., has had work started on a brick and concrete garage on Beach street that will accommodate thirty cars as well as having space for a repair shop.

**Grand Rapids, Mich.**—The Reid-Blickley Automobile Co., Bond avenue and Michigan street, has changed its name to that of Reid Auto Co., Mr. Blickley having started into business for himself at Jefferson avenue and State street.

**Detroit, Mich.**—J. Doyle, during 6 years manager of the Detroit branch of the Ford Motor Co., and at present distributor for the Saxon cars for the state of Michigan, has been selected by Dodge Bros. to be their Detroit distributor. The local quarters will be at Jefferson avenue and Brush street.

**Columbus, O.**—Frank J. Girard, who has been in charge of the Peerless branch at Columbus, located at 168 North Fourth street, has been appointed district manager for the Peerless and will make his headquarters here. He will have all of central and southern Ohio in his territory. A service station will be maintained at 111 East Lynn street with R. L. Gardner in charge.

**Columbus, O.**—The Capital Motor Car Co., which recently was formed with a capital of \$10,000, has been organized by the election of Ira P. Madden, president; E. P. Kelly, treasurer and vice-president; R. P. Atkinson, general manager and C. A. Hayes, secretary. The concern will act as central Ohio distributor for the Reo for 1915 and will also handle the Jeffery locally. The

concern will be located at 168 North Fourth street, in quarters formerly occupied by the Peerless branch.

**Fort Worth, Tex.**—The Chalmers Motor Sales Co. has been organized here by G. C. Tippins and S. C. Creech, with showrooms at 510 Throckmorton street.

**Milwaukee, Wis.**—Theodore V. Bethke and Herbert S. Inbusch, Milwaukee, Wis., have formed a partnership to act as state distributor for the Hassler shock absorber for Ford cars.

**Detroit, Mich.**—The Knight Tire and Rubber Co., of Canton, O., has taken over the Detroit agency and changed it into a branch. The headquarters are at 580 Woodward avenue and Fred Harrington is the manager.

**Chicago**—After several years of directing Studebaker sales in Chicago and other cities, C. R. Dashiell, vice-president and sales manager of the L. Markle Co., local Studebaker distributor, has resigned to take the Dodge Bros. agency here.

**Milwaukee, Wis.**—The M. & F. Sales Co., 422 Jefferson street, Milwaukee, agent for Packard and Hurdmann tires, shock absorbers and other specialties, has purchased the Consumers' Tire Co., 701 Wells street, Milwaukee, and moved to the Consumers' location.

**Boston, Mass.**—Harry N. Pyke assumed charge of the Boston branch of the Chalmers Motor Car Co. August 1 when the Whitten-Gilmore company dissolved and relinquished the agency. He had been with the Chalmers company for 6 years, the greater part of the time at New York.

## RECENT AGENCIES APPOINTED BY MOTOR CAR MANUFACTURERS OF PASSENGER CARS

Town	Agent	Make	Town	Agent	Make
American Falls, Ida.	A. W. Davis Auto Co.	Detroiter	Lanesboro, Minn.	Torger Elstad	Kisselkar
Beaumont, Tex.	Thomas Van Auken Co.	Kisselkar	Middleton, N. Y.	Central Garage Co.	Kisselkar
Barbourville, Ky.	W. H. McDonald	Ford	Milwaukee, Wis.	Stanley Steamer Co.	Lewis
Calais, Me.	Wm. Alexander	Kisselkar	Milwaukee, Wis.	F. G. Hensler	Pathfinder
Clinton, Ia.	C. A. Fay	Kisselkar	Milwaukee, Wis.	Schreiber-Boorse Motor Co.	King
Concord, Mass.	Torry & Vialle	Kisselkar	Milwaukee, Wis.	Regal Motor Co.	Regal
Columbus, O.	Gaither Auto Co.	Wahl	Minneapolis, Minn.	John E. Fawkes	Oldsmobile
Columbus, O.	Central Auto Vehicle Co.	Paige	Mogog, Que., Can.	W. T. Peters	Maxwell
Canal Dover, O.	Dover Automobile Co.	Chandler	Milwaukee, Wis.	Stanley Steamer Co.	Lewis
Columbus, O.	E. J. Thornton	Winton	Montreal, Can.	Frigon & Baker	Chandler
Columbus, O.	Cummins Auto Sales Co.	Krit	Medicine Hat, Can.	Diehl Motor Car Co.	Franklin
Columbus, O.	Snyder Automobile Co.	Allen	Moose Jaw, Can.	Henry B. Annabel	Maxwell
Calgary, Alta., Can.	Thomas E. Jackson	Maxwell	Niagara Falls, Can.	Crane Brothers	Marathon
Calgary, Can.	H. T. Sheffield	Haynes	Nashville, Tenn.	Burton Auto Co.	Mitchell
Connellsburg, Pa.	Connellsburg Garage Co.	King	Nashville, Tenn.	Hartsfield Auto Co.	Ford
Cedar Hill, O.	C. E. Hartman	Paige	New Durham, N. J.	Arthur T. Bruce	Kisselkar
Detroit, Mich.	Lininger-McHugh Co.	Briscoe	Omaha, Neb.	Noyes Auto Co.	Kisselkar
Denver, Colo.	Western Motor Car Co.	Chalmers	Ottawa, Ont.	Hull & Ottawa Garage Co.	Brockville Atlas
Evansville, Ind.	Kork & Co.	Ford	Paris, Can.	A. C. Lee	Saxon
Edmonton, Can.	Rex Motors	Rex	Port Huron, Mich.	George E. Yokum	Buick
Edmonton, Can.	Dominion Motors, Ltd.	Paige-Detroit	Portland, Me.	E. F. Gellerson	Kisselkar
Estevan, Can.	Frederichson & Green	Maxwell	Passaic, N. J.	Sheely Motor Co.	Kisselkar
Gananoqua, Can.	W. G. Gibson	Maxwell	Radnor, O.	Frank Coonfare	Paige
Hackensack, Pa.	Peoples Express Trans. Co.	Kisselkar	Richwood, O.	R. G. Roberts	Paige
Hamilton, Can.	Jack V. Elliott	Haynes	Santa Ana, Cal.	C. E. Isaacson & Son	Kisselkar
Havana, Cuba	Julian P. Abren	Kisselkar	Sarnia, Can.	Hitchcock & Richardson	Franklin
Hallsville, O.	H. S. Boecker	Paige	Saginaw, Mich.	Hubbell Auto Sales Co.	Ford
Jamaica, L. I.	Richard Val Siclen	Kisselkar	Tuscaloosa, Ala.	J. T. Pullen	Kisselkar
Jackson, Mich.	Briscoe Sales Co.	Briscoe	Tulare, Cal.	W. A. Swall	Kisselkar
Louisville, Ky.	F. E. Van Patton	King	Toronto, Can.	H. E. Rickettson	Kisselkar
London, Can.	Central Garage	Chandler	Twin Falls, Ida.	Pike Auto Co.	Detroiter
Lansing, Mich.	A. W. Brown & H. L. Brown, Jr.	Briscoe	Toronto, Can.	Brintnell Motors, Ltd.	Chandler
Lexington, Ky.	Commercial Auto Co.	Ford	Toledo, O.	Litchie Automobile Co.	Lozier
Los Angeles, Cal.	Smith Brothers	Premier	Toronto, Can.	British Canadian Import Co.	Napier
Los Angeles, Cal.	Smith Brothers	Peerless	Winnipeg, Man.	Manitoba Electric Motor Car Co.	Van Auken
Los Angeles, Cal.	Smith Brothers	Ohio	Victoria, B. C.	J. Cameron	Lozier
Logan, O.	Theodore Johnson	Paige	Winnipeg, Can.	J. H. Weeks	Malcolm
Lamoille, Ill.	Charles H. Wells	Kisselkar	Waco, Tex.	Willis-Halff Co.	Hudson



# The Motor Car Repair Shop



ADDING another set of exhaust valves to an L-head or T-head motor, while not possible with all existing type of motors, can be done in many of the older engines and in many of the present ones. The addition of the extra set of valves, undoubtedly will give more power and in many instances it would pay to reconstruct the old motor.

A plan which should work out, is that of having a foundry, cast special valve plugs to take the place of those now fitted over the exhaust valves. These plugs must have a valve stem guide cast integral, or a guide may be constructed by threading a small piece of brass tubing into the center of the cap. The bottom of the cap should be beveled, as shown in Fig. 2 if 45-degree valves are to be used and faced well if flat-seated valves are to be installed. The new valve caps must be sufficiently high to allow of a passage out, of the exhaust gas. Many outlets arrangements are possible, all of course, depending upon the type of engine. The operation of the extra set of valves may be through lift rods and rocker arms as the illustration shows. The push rod of the regular exhaust valve may be fitted with a clamp as shown. This clamp consists merely of a divided end through which a bolt passes, the hole shown being for the regular exhaust valve stem or other part of the regular exhaust valve system. The end of the clamp is tapped to receive a small bolt with a nut and locknut as shown. This forms a means of adjusting the extra set of valves. A bracket of some sort must be provided for the rocker arm fulerum and this may be attached to the cylinder casting or to the valve cap. Care must be taken in the construction of this system to see that the valve lift is not too high, so as to have both valve heads meet in the chamber. In some instances new cams would be necessary, but if the sum of the

## Installing Extra Set of Valves

two valve areas is no greater than the old valve area the reconstruction had best be forgotten.

Another method of obtaining the same result as mentioned above is shown in Fig. 1. Here a large casting is shown for a T-head motor but it can be designed for an L-head as well. The casting illustrated has shoulders at the bottom, these shoulders fitting into the valve cap holes. The bottom of the shoulders act as the valve seat and it would be simpler to use flat-seated valves here. A gasket placed at the shoulder would prevent leakage. In casting this piece the design of the engine must be taken into consideration, for the lugs used for holding down the casting must be bolted to a suitable part of the cylinder. It probably would be better to remove the valve cap threads so as to cause the shoulders to give a better fit.

The valve stem guide could easily be cast integral. One opening for the attachment of the extra exhaust pipe would do as well as the two shown in the illustration. It will be noted the rocker arm arrangement and the tappet construction is similar to that of the type previously described. If the motor is extremely long and the cylinders cast in pairs, or three if it be a six, the overhead casting may be made in sections, thus saving metal but increasing the cost slightly.

The two arrangements shown herewith are merely

suggestions and in this department next week a description will be given of a reconstructed 1913 Mercedes motor in which the overhead valves were placed over the water jacket and the valve operation being through rocker arms controlled by a separate set of cams.

### A Helpful Hint

While out in the country should a tire blow and no patch be at hand a piece of an old rubber boot can be obtained of a farmer, and used as a patch.

### Table of Gradients

The table shown below will be valuable to many motorists who have no grade-indicating instrument on the car and wish to tell approximately the steepness of a hill. If the top of a hill is 50 feet above the starting point and the base of the hill is 1,000 feet long, the hill has an inclination of 50 in 1,000 or 1 in 20 or 5 per cent.

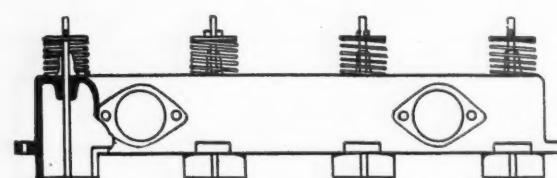


Fig. 1—This illustration shows how an extra set of valves may be installed in an L-head motor. The casting at the left has deep shoulders to fit into the places formerly occupied by the valve plugs. Flat-seated valves are illustrated but the 45-degree type could be used instead. The casting above serves as the exhaust header as well as the chamber for the valves. Two outlets to the exhaust pipe are shown, but it could be constructed with one large one in the middle of the casting.

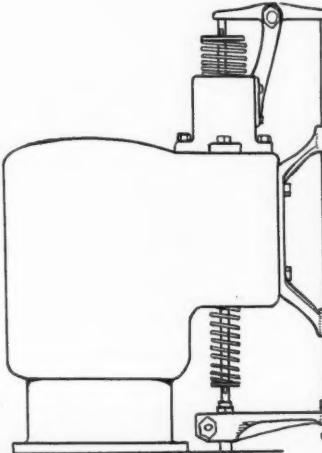


Fig. 2—This shows how a specially constructed valve cap can be used in the capacity of a valve chamber. There must, of course, be some arrangement for attaching an exhaust pipe to the separate plugs. This would not be possible on all makes of engines. The detail at the right shows the tappet extension for operating the overhead valves from the main tappet. The end of this extension is fitted with an ordinary bolt with nut and locknut for adjustment purposes.

These units are given in the first column below, the percentage of the gradient in the second column and the corresponding angularity measured in degrees and minutes, in the last column.

Units	Per Cent	Equal to Angle of
1 in 5	20	11° 19'
1 " 6	17	9° 26'
1 " 7	14	8° 09'
1 " 8	12.5	7° 08'
1 " 9	11	6° 17'
1 " 10	10	5° 43'
1 " 11	9	5° 11'
1 " 12	8	4° 46'
1 " 13	7.75	4° 24'
1 " 14	7	4° 05'
1 " 15	6.5	3° 49'
1 " 16	6.25	3° 35'
1 " 17	6	3° 22'
1 " 18	5.5	3° 11'
1 " 19	5	3° 00'
1 " 20	5	2° 52'
1 " 25	4	2° 18'
1 " 30	3.3	1° 55'
1 " 35	2.8	1° 38'
1 " 40	2.5	1° 26'

# The Extra Guarantee

Extra Experience  
Extra Value  
Extra Security  
Extra Organization



Into the crucible go the ideas of many men—of many firms—many great manufacturing centers—many countries. They melt, and blend, and from their fusion comes a motor free of the dross of inexperience, of guesswork, of freakishness—comes a fusion clean, refined—a Continental Motor.



## Continental Motors

Over one hundred firms—American and European—use the Continental Motor in some of its several models. Weigh the importance, the significance of their combined stamp of approval. Judge the soundness of design that passes more than a hundred censorships; of the sureness of construction that five score companies link their reputations with.

### What Continental Motors Mean to Dealers

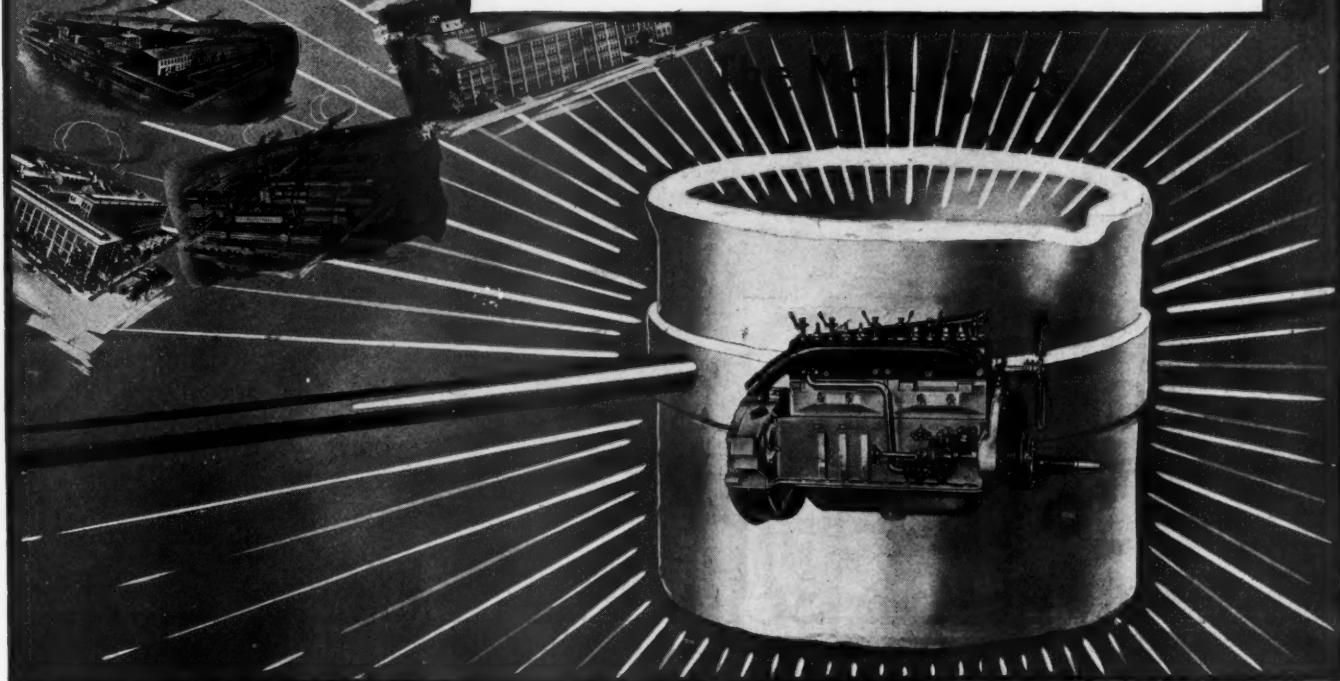
A Continental Motor is the most efficient member of the dealer's sales force. The dealer is not obliged to argue the merits of a sound and established motor—a motor which stands for the best ideas of the leading engineers of two continents. He can devote his energies to other selling points of any vehicle equipped with a Continental motor.

More than that—it is becoming daily more true that men gauge cars largely from their motors.

And thus, though a Continental Motor represents say 25% of the whole cost of a motor vehicle, it actually often clinches sales 30 and 40 and, yes, even 50%.

The public is motorwise. Specify Continental!

**CONTINENTAL MOTOR MFG. CO.**  
LARGEST EXCLUSIVE MOTOR BUILDERS IN THE WORLD  
Detroit, Michigan



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# From Mine to Motor

From the time our raw materials arrive at our factory siding direct from the mines, till they leave our shipping department as completed instruments, no hands other than those of Schebler workmen touch a Schebler Carburetor.

Every step in the manufacture of a Schebler Carburetor is consummated within our walls—under the eyes of an army of **SPECIALISTS**, who through doing one particular thing only have learned to do that one thing rapidly, accurately, **ECONOMICALLY**.



**WHEELER & SCHEBLER, Indianapolis, Ind.**

# The Hand Klaxon

\$10



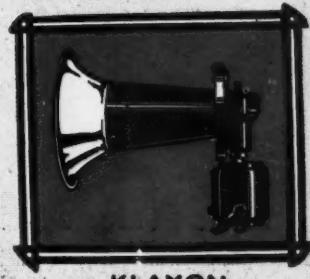
Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

## KLAXON

*"The Public Safety Signal"*



KLAXONET



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# National SIX ANNOUNCEMENT

## New Series



\$2375

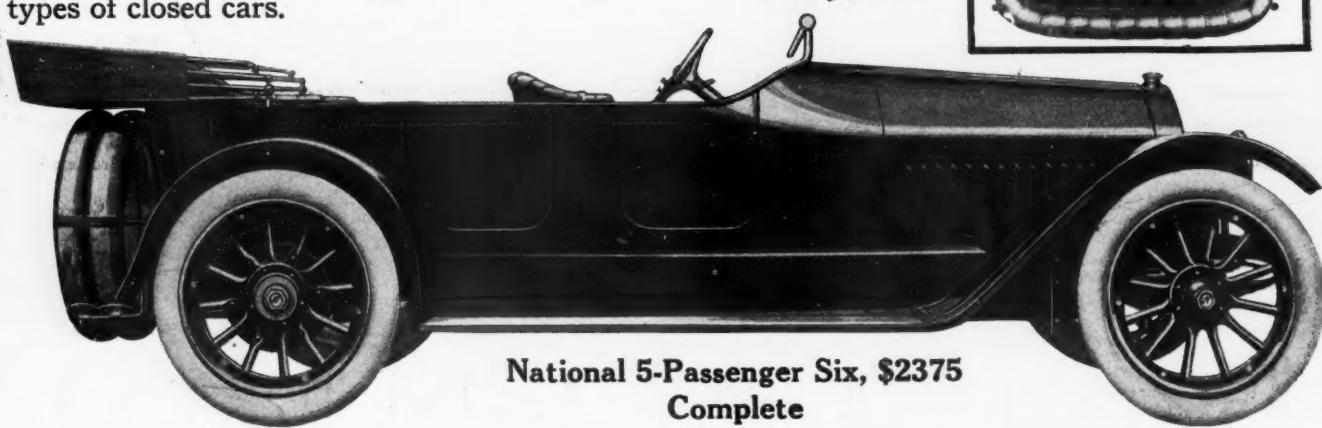
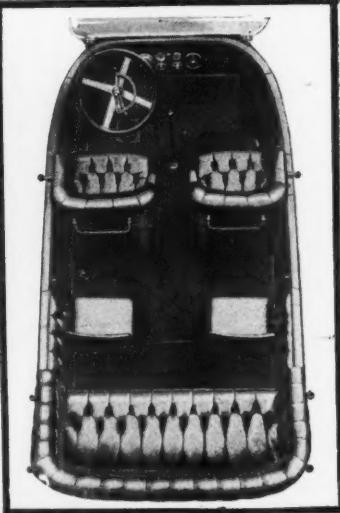
Release announcement National New Series Six, as we are already to make deliveries. New series is another advancement - another chapter in National's history of quality designing. Our dealers have unanimously approved. All the accumulated honor of National victories is represented. In short National reputation so faithfully earned is incorporated. Please print pictures. Request dealers not to delay. We have a liberal offer.

P.S. Our business for year ending July largest ever, even surpassing last years increase. Prospects still better now.

National Motor Vehicle Co.,  
Indianapolis, Ind.

The new series National cars are built in 2, 4, 5, 6 passenger open bodies, also in two types of closed cars.

*Interior of  
Six Passenger  
Six Cylinder-*

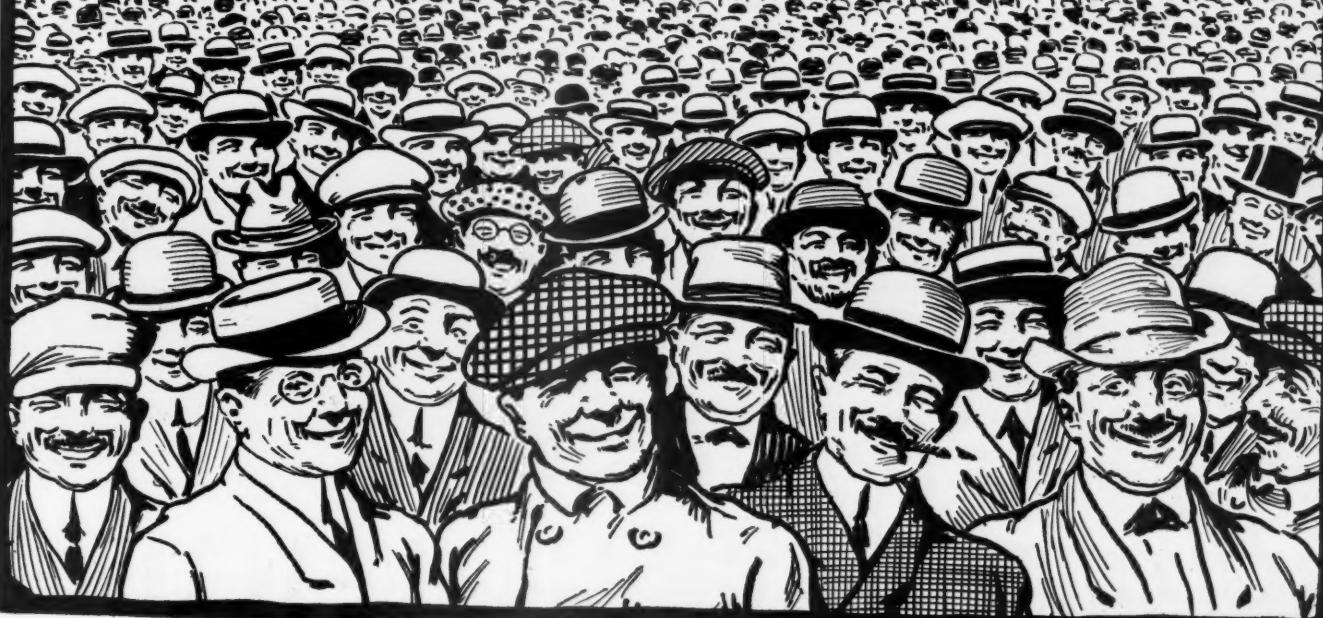


National 5-Passenger Six, \$2375  
Complete

The dealer can be no more successful than the factory he represents.

**National Motor Vehicle Company, Indianapolis, Indiana**

# 400,000 PEOPLE USE WILLARD STORAGE BATTERIES



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# Premier Weidely

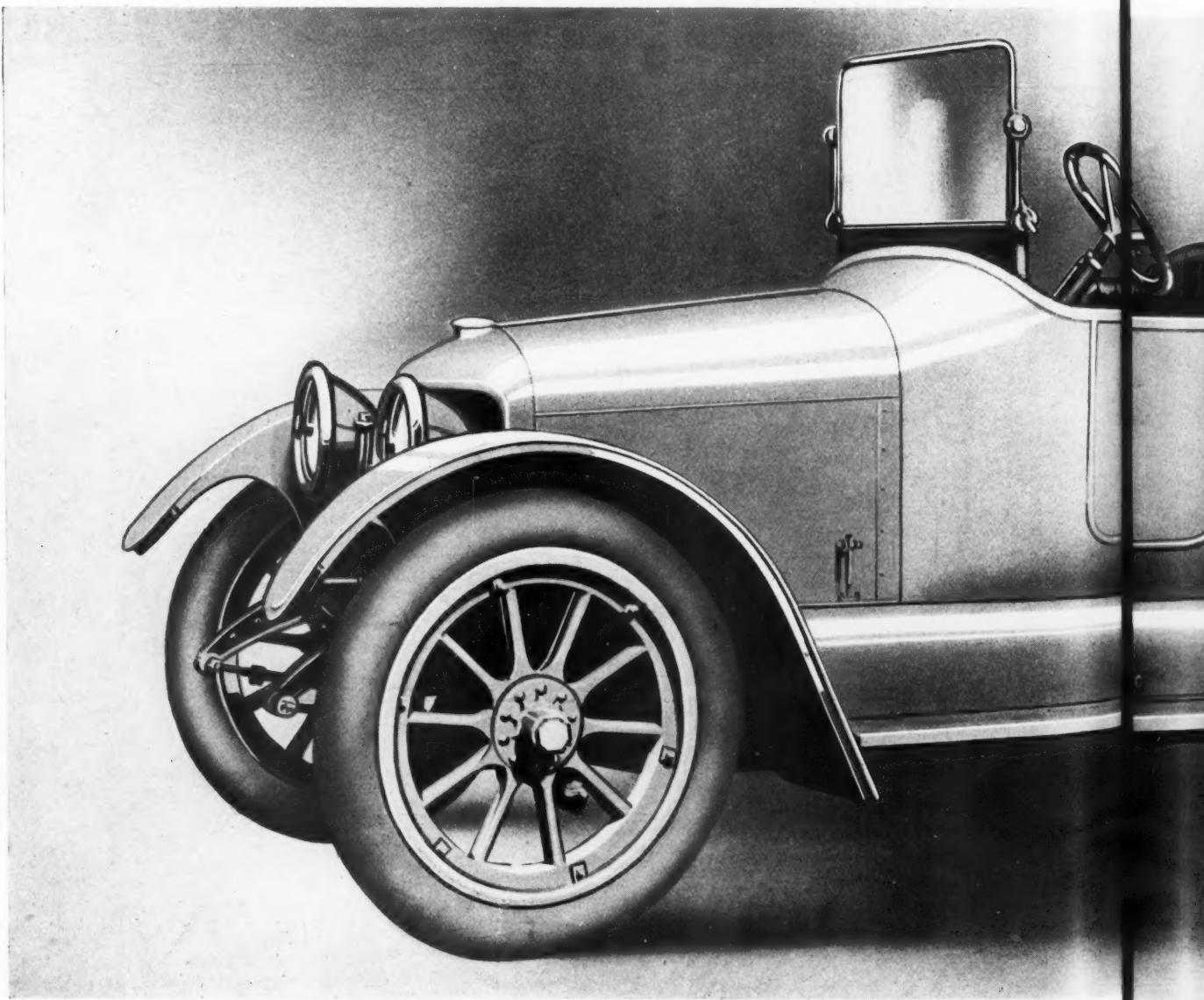
*New 1915 Model*



This marvel of motor cars commends the admiration of leading motorists and engineers throughout this country and abroad. Everyone who is interested in the highest development of motor design, and car perfection, should get acquainted with the Premier Weidely—should ride in it and realize what a great accomplishment is to the credit of the

Premier Motor Mfg. Co., and to the credit of George A. Weidely, Premier's chief engineer.

Illustration and description falls so far short in doing justice to this wonderful car that we urge you, Mr. Motorist, to arrange with the nearest Premier dealer to demonstrate the wonderful merit of this greatest car of all times. Test its roadability,



## PREMIER MOTOR MANUFACTURING

*When Writing to Advertisers, Please Mention Motor Age.*

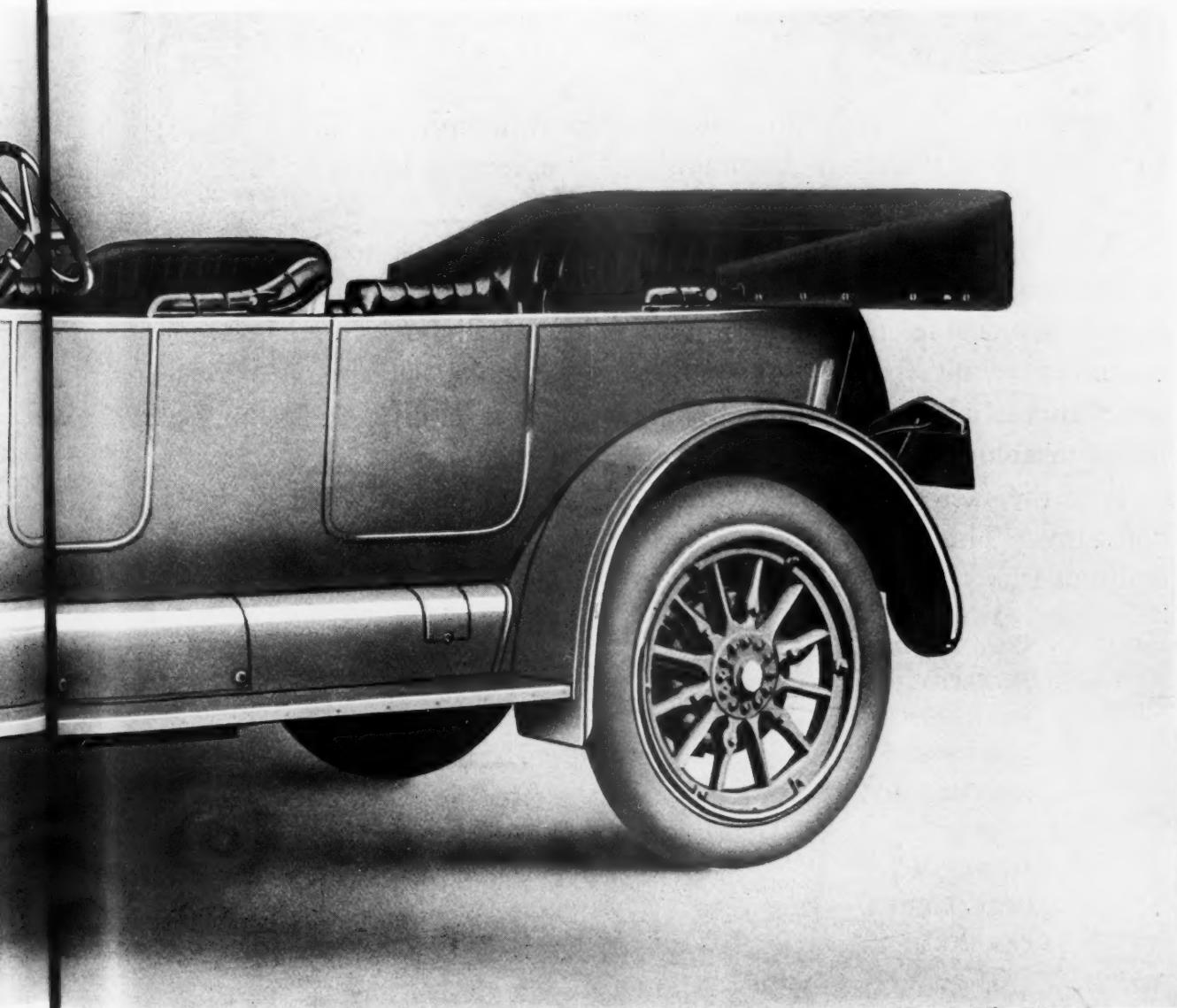
its mileage per gallon of gasoline, its remarkable power and speed. Then we want YOUR verdict. We want you to share in our honest enthusiasm.

The great interest and demand created by the Premier Weidely is due to MERIT. The Weidely motor has practically doubled the possible miles to be gotten from a gallon of gasoline.

It has greatly increased the possible power to be gotten from a given bore and stroke. The Weidely assures the permanent superiority of the poppet valve type of motor. It is the most important development in the motoring world during the past ten years. If you desire catalog with detailed specifications, and the name of nearest dealer, write us today.

# Premier Weidely

**\$2700 f. o. b. Indianapolis**



**G COMPANY, - - Indianapolis, Indiana**

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To everybody, "Waltham" means a good timepiece. The presence of a Waltham Automobile Timepiece is taken as proof that the car's equipment is *right*.

A car with a Waltham will not keep coming back to the dealer with a "clock out of order". The Waltham is the only timepiece scientifically built to resist road shocks and changing temperatures. It will save you time and petty annoyances; it will help to keep your customers happy. It is indispensable in the equipment of the high-grade car.

Ask the factory for the Waltham! You will be in good company. These cars use the Waltham for regular standard equipment:

CRANE  
DETROIT  
FRANKLIN  
JEFFERY  
LOCOMOBILE  
LOZIER  
MARMON  
OLDSMOBILE  
PACKARD

PIERCE-ARROW  
RAUCH & LANG  
ROLLS-ROYCE  
RUSSELL-KNIGHT  
SIMPLEX  
STEVENS-DURYEA  
WHITE  
WINTON

**Waltham Watch Company, Waltham, Mass.**

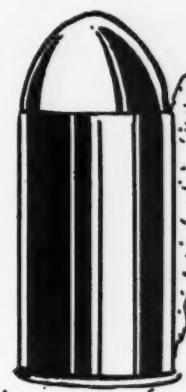
# AMERICA'S PEACE OFFERING:



Increases  
power



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USED ALL OVER THE WORLD AS  
THE MOST EFFICIENT SPARK PLUG  
\$1.00 ---- WORTH IT

EMIL GROSSMAN MFG. CO., Inc.  
BUSH TERMINAL  
MODEL FACTORY NO. 20  
BROOKLYN (NEW YORK CITY) U. S. A.

# Who will get this money?

CAR owners in your city are ordering power tire pumps from us direct because they can't get them quick enough. This shows the demand for the Stewart Tire Pump, and the dealer who is wise enough to get after this business first is going to crowd the others off the selling map, just as they're doing in other localities.

Car owners won't pump tires by hand any longer. Tire makers tell them that hand pumping isn't the right way to blow up tires—they tell a car owner that he would save nearly half his tire expense if he used a power pump. And this is why car owners are flooding us with inquiries about our Stewart Tire Pump, and are crowding to get it.

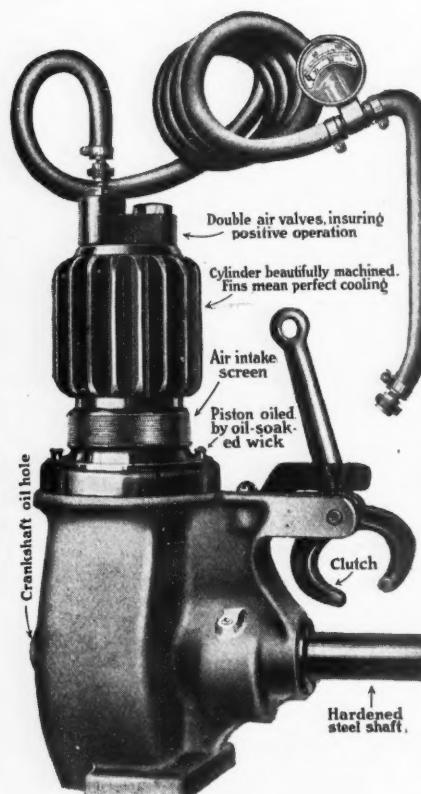
The Stewart Tire Pump is by all odds the best and most efficient tire pump made. No rubber nor leather packings to wear and leak,—no oil can possibly get into tires. It pumps up a big tire in five minutes or less and never balks. Its retail price, with air-pressure gauge and 13 feet of high-grade hose, complete including bracket and gears for immediate installation, is only

**\$15**

When ordering, give name, year and model of car the pump is wanted for.

Who will get this profit from sales and installations in your vicinity? Why not you? Write us now for our Dealers' Proposition.

## Stewart Tire Pump



with complete fittings for immediate installation, may be had for the following cars (this list is being added to almost daily):—

CAR	MODEL	YEAR	CAR	MODEL	YEAR
Abbott Detroit	35	1914	Oakland	35	1914
Abbott Detroit	44-50	1914	Oakland	6-60	1913-14
Abbott Detroit	6-Cyl.	1914	Oakland	42	1913
Auburn		1914	Oldsmobile	6	1914
Buick	24 & 25	1913	Oldsmobile	42-4	1914
Buick	24 & 25	1914	Overland	79	1914
Buick	Big Six	1915	Overland	71	1913
Cadillac		1913	Overland	69	1913
Cadillac		1914	Packard	1-38	1914
Case	40	1914	Packard	3-48	1914
Case	25	1914	Packard	30	1908
Case	35		Packard	30	1909
Chalmers	Little Six—26	1914	Packard	30	1910
Chalmers	Big Six—6-60-24	1914	Packard	30	1911
Cole	4-Cyl.	1913	Packard	30	1912
Cole	6-Cyl.	1914	Packard	36	1914
Cole	4-Cyl.	1914-15	Pathfinder		1913
Cartercar	5A	1913	Rambler	Cross Country	1914
Cartercar	5A	1914	Reo	The Fifth	1911
Cartercar	7	1914	Reo	" "	1912
Ford			Reo	" "	1913
Hudson	6-40	1914	Studebaker (EMF)	4-30	1912
Hudson	6-54	1914	Flanders	4-20	1912
Havens Six		1913	Studebaker	4 & 6 Cyl.	1913
Jeffery	4	1914	Studebaker	4 & 6 Cyl.	1914
Lexington Howard	4	1914	Westcott	4-40	1912
Lexington Howard	6	1914	Westcott	4-40	1913
Maxwell	25	1914	Westcott	0-30	1914
Maxwell	35	1914	Westcott	0-30	1915
Maxwell	6	1914			
Mitchell	6	1913			
Mitchell	Baby Six	1912			

**Stewart-Warner Speedometer Corporation**

Executive Offices: 1967 Diversey Blvd. Chicago

Factories: Chicago and Beloit, Wisc.

17 Branches. Service Stations in all cities and large towns.

Beginning the SEVENTH YEAR  
of Exclusive Six-Cylinder Experi-  
ence Comes the New

# McFARLAN SIX

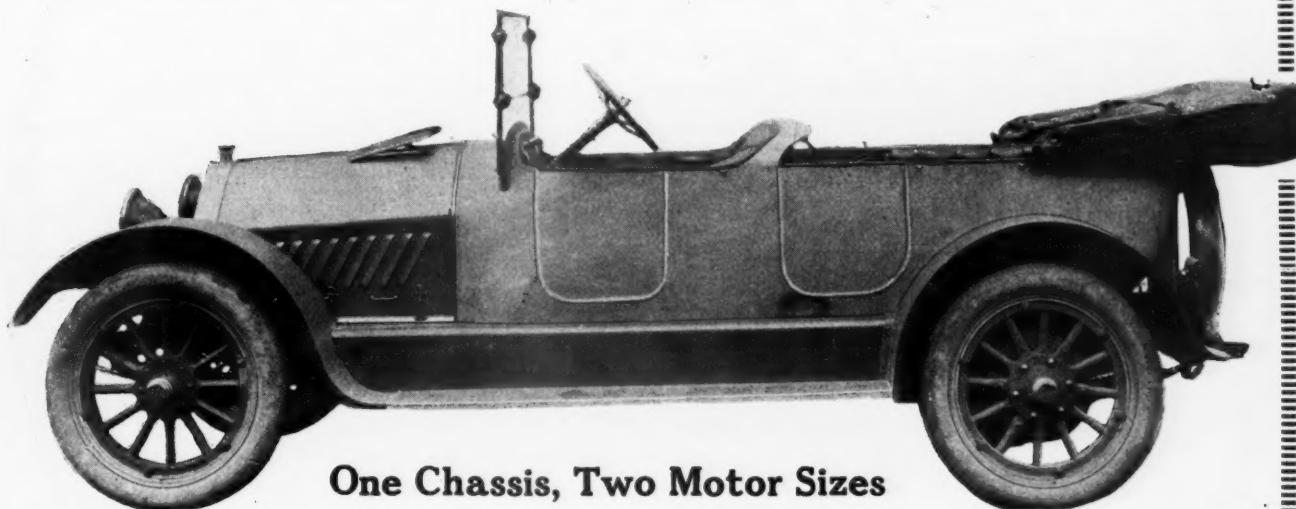


UNIQUE IN APPEARANCE. EVERY ADVANCED FEATURE. UNEQUALLED BEAUTY. LIGHTER BUT NOT WEAKER. MOST COMFORTABLE CAR BUILT. 3 TO 60 M. P. H. ON HIGH. EASIEST RIDING QUALITIES. BETTER VALUE. MOST CONVENIENTLY ARRANGED. FEW CHASSIS CHANGES.

MOST ECONOMICAL CAR, POWER CONSIDERED, IN THE WORLD. WIDEST RANGE OF CHOICE OF INDIVIDUAL FEATURES. A CAR TO BE PROUD OF, WHATEVER THE COMPANY OR OCCASION.

## THE ONLY TRIED AND PROVEN MEDIUM-PRICED SIX ON THE AMERICAN MARKET

Six years of exclusive six-cylinder experience are built into it, the only medium-priced six so backed. Present chassis model unchanged, except in detail, for three years. Proven to be as good as it is possible to build. Built on a STRICT QUALITY BASIS FOR LONG LIFE, not to meet a mad, competitive price. Extreme only in the margin of safety for passengers. A car for the man who wants the BEST VALUE rather than the lowest price.



One Chassis, Two Motor Sizes

**SERIES T—4" x 6" motor, 67 H. P., 2, 4, 5, 6 and 7-Pas-**  
senger Open Models..... \$2590.00  
4-Passenger Coupe..... \$3300.00  
7-Passenger Limousine..... \$4000.00

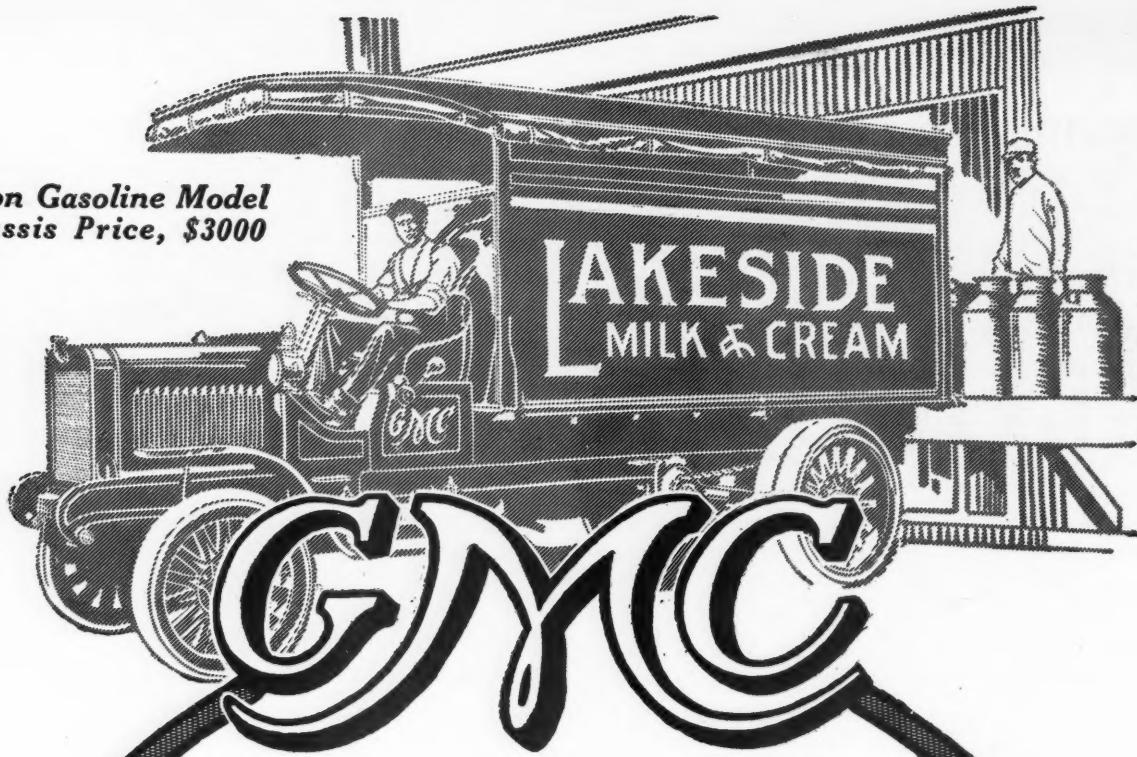
**SERIES X—4½" x 6" motor, 90 H. P., 2, 4, 5, 6 and 7-**  
Passenger Open Models..... \$2900.00  
4-Passenger Coupe..... \$3610.00  
7-Passenger Limousine..... \$4310.00

Westinghouse Electric or McFarlan Pneumatic Starter optional, no extra charge. Westinghouse Ignition. Klaxon Horn, large size. Warner Speedometer. Truffault-Hartford Shock Absorbers all around. Firestone Rims. Non-Skid Tires on rear wheels. L.B.A. Storage Battery. Tire pump on all models with hose and gauge. One-Man Top optional. One-Minute Curtains. Improved tire carrier on rear, only one buckle to loosen. New body lines, all smooth, no hinges. More room in bodies. Concealed box for small articles in tonneau. Dimmer attachment on headlights. Ball bearing steering knuckles. Vacuum gasoline feed. Gasoline tank in rear. New type Stromberg Carburetor, more economical. Inspection lamp and cigar lighter. Longer wheelbase, now 132". Three hundred pounds less weight. Softer upholstery. Primer. Silk mohair tops. Individual Service:—Optional colors; optional colors and styles of upholstery. Every car fitted, painted and equipped to individual ideas, if desired.

THE CATALOGUE IS READY

**McFARLAN MOTOR COMPANY, CONNERSVILLE, INDIANA, U. S. A.**

**5 Ton Gasoline Model  
Chassis Price, \$3000**



# The Only *Complete* Line

General Motors Trucks lead the field in commercial vehicles. Never before has a single company made such a variety of motor trucks. Big trucks and little ones, of different load capacities, and in both gasoline and electric powers.

Business men should understand the magnitude and broadness of our manufacturing plan. It is comprehensive and complete.

It means the *right* truck for *your* business at a price you are willing to pay.

And GMC Trucks not only meet the needs of your business from the standpoint of proper size and power. They are commercial vehicles of the very highest grade.

In their design and production the future owner was uppermost in the minds of the builders.

Cheap upkeep, low maintenance cost, simple operation and easy care, together with durability and unfailing performance, are the natural results of G MC construction.

By an investigation you can convince yourself that a GMC Truck will do your work with utmost economy—economy of *first* cost and, more important, economy in *ultimate* cost.

You will not find it necessary to shape your service to fit the truck. You can choose a truck to fit your service. If you are interested in motor trucks, either as a possible user or as a dealer, now or a year hence, you should read "Truck Talk." It will cost you nothing but a request and may mean much to your business.

# GENERAL MOTORS TRUCK COMPANY

One of the Units of the General Motors Company  
**Pontiac** **Michigan**  
Branches:—New York, Boston, Chicago,  
Philadelphia, Kansas City, Detroit,  
St. Louis

*When Writing to Advertisers, Please Mention Motor Age.*



## "If You Would Feel Your Auto Like a Bird on Floating Wings"

1

Little drops of water;  
Little flakes of dust,  
Get between the Spring Leaves,  
And create the DEMON rust.

2

But little strips of Insert  
Placed between the leaves,  
Keep out the wicked DEMON,  
And put the Springs at ease.

3

So if you would feel your auto  
Like a bird on floating wings,  
That bears you smoothly onward,  
"Oil Cushionize" your Springs!

### *The* DANN OIL CUSHION SPRING INSERT

"The Insert of 10,000 Oil Pockets"

Install DANN Insert today and tomorrow you will declare it to be the best investment in **easy riding** you ever made. You will never again drive a car that has not been "Oil Cushionized."

Cars equipped with DANN Insert slip along rough roads, slide over bumps, and glide through ruts, as if the highway were a feather-bed.

Write for handsomely illustrated booklet on "Why Cars Wear Out." It is free for the asking.

My Boss took all  
the squeaks out  
of me by installing  
DANN INSERT!

I wish  
mine had!

FORD MOTORISTS: We are prepared to supply **DANN FORD INSERT**, neatly packed in a box, with instructions, and ready for immediate installation in the springs of any Ford car. Write for full particulars.

Dealers Wanted Everywhere

**"Oil Cushionize Your Springs!"**

### DANN OIL CUSHION SPRING INSERT COMPANY

2252 Indiana Ave., Chicago, Illinois





**\$9.50 to \$15.00**

# SPARTON

## ELECTRIC MOTOR DRIVEN AND HAND OPERATED SIGNAL

The motorist cannot afford to depend on a good enough warning signal. When the time comes for action, he must have a horn that will compel quick, unthinking, instantaneous jumping—such is the discordant, action-compelling growl of the SPARTON when the button is pushed home. On country stretches a good pressure on the button produces a warning clarion that can be heard a mile down the road, giving everyone time to get out of the way. On city streets a light touch produces an inoffensive, but authoritative command, warning people at close range.

**Hand  
Operated**

**\$7.00**

**and**

**\$8.00**



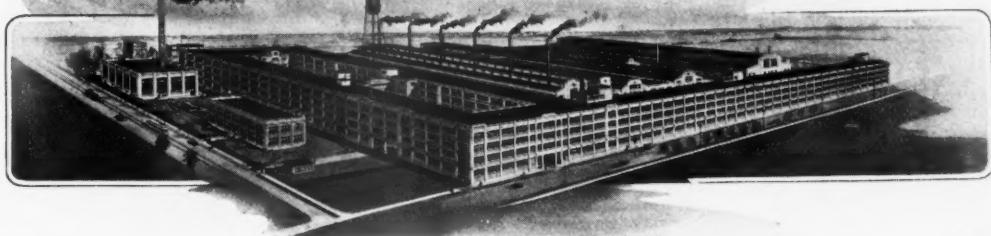
**Hand  
Operated**

**\$7.00**

**and**

**\$8.00**

**The Sparks-Withington Co., Jackson, Mich.**



## DODGE BROTHERS DETROIT

NOTE: Copies of an illustrated sixteen page pamphlet, "Information for the Trade Concerning Dodge Bros., Detroit," was recently mailed to motor car dealers. We will gladly supply any interested dealer who may not have received a copy.



HIGH *and*  
LOW TENSION  
MAGNETOS



MASTER VIBRATORS  
ROAD SMOOTHERS  
AUTO LOCKS

## A Hot Fat Spark Timed Accurately

The world's foremost engineers know this to be the secret of perfect ignition. Over 100,000 users of K-W Master Vibrators know that the large, powerful condenser and generous, solid, platinum iridium contact points found in their K-W Master Vibrators give that kind of a spark. You will get the same reliable and efficient service by demanding the original



## MASTER VIBRATOR

### ITS USE MEANS

Perfect Ignition—More Power

One adjustment instead of four

A hotter spark—Easier Starting

A smoother running engine

Less carbon deposits—Less gasoline used

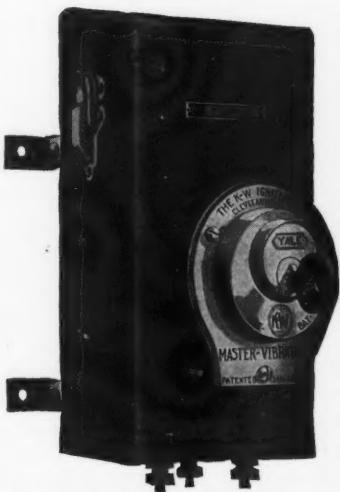
Cleaner spark plug—No worry



\$15.00 With Regular  
Kick Switch

The K-W Master Vibrator is the Standard of Excellence all over the world

In buying your Master Vibrator be sure you get a K-W. Look for the K-W trade-mark and the serial guarantee number. They protect you against imitations. If your dealer can't supply you we will send one direct, postpaid, on receipt of price. Write for "That satisfied feeling Folder."



\$16.00 With K-W  
Autolock Switch

HEADLIGHTING  
OUTFITS

THE **K-W** TRADE  
MARK  
IGNITION CO.  
2835 CHESTER AVE  
CLEVELAND, OHIO, U.S.A.

SPARK COILS  
SPARK PLUGS



## A Big Value Electric Horn at a Lilliputian Price

The REXO II is unconditionally guaranteed for the life of any car; and it is guaranteed for a life of dependable service. The all-commanding warning note of the REXO II gains heedful recognition in any traffic conditions.

# REXO II

## \$3.85 Ready to Attach

The remarkably low price of the REXO II is due to exceptional manufacturing equipment and facilities which make possible the production of the highest quality of product at the lowest possible cost.

REXO II is built by efficiency methods for efficiency purposes.

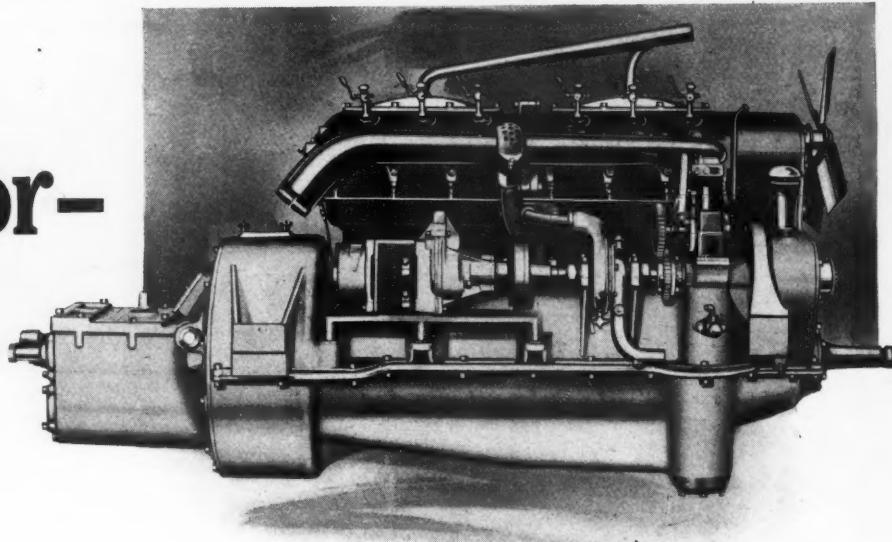
**DEALERS:** The REXO II is the best to buy—the easiest to sell. Write for our unique co-operative sales plan.

**THE GARFORD MANUFACTURING COMPANY**  
2503 Olive Street, ELYRIA, OHIO, U. S. A.

**BRANCH**  
The Garford Mfg. Co.,  
Kansas City, Mo.

**DISTRIBUTORS** { The Dean Electric Co., Seattle, Wash.  
The Dean Electric Co., Los Angeles, Cal.  
Sumter Telephone Supply Co., Sumter, S. C.

# The Motor- most important unit of any car



An automobile is something that carries you over the road. The unit that makes it go—the motor—is, after all, the one feature that merits your most thoughtful consideration in your car selection.

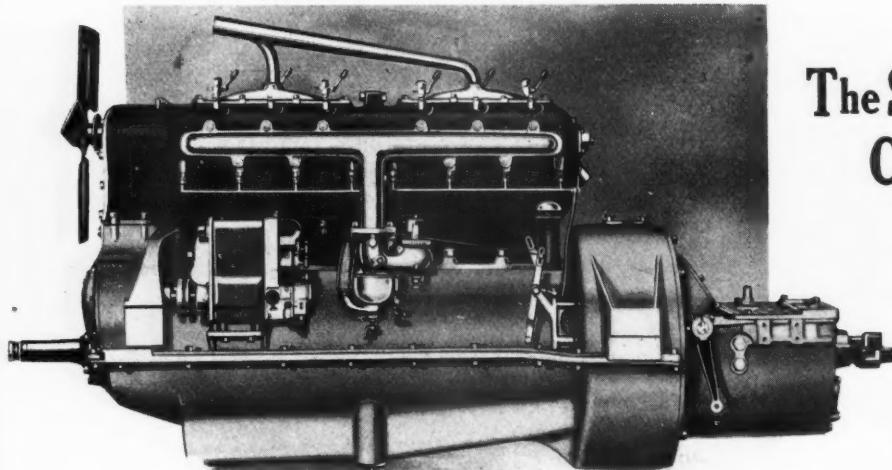
The Speedwell Six Cylinder, Rotary Valve Motor is the most advanced of any tested and proven type of automobile motor. Of its scores of advantages the principal ones are—simplicity, freedom from valve wear and adjust-



ment, silence, lack of vibration, greater power and efficiency, and longer life.

The new Speedwell catalog explains why this motor is better—send for your copy. SPEEDWELL ROTARY SIXES are built in one chassis model—the wheelbase is 135 in., Westinghouse starting, lighting and ignition, Golde-Patent one-man top, and finest and most complete equipment throughout.

Four & five pass. touring models \$2850  
Six & seven pass. touring models 2950



**The Speedwell Motor  
Car Company**  
Dayton, Ohio

*"The first car in  
America with Rotary  
Valve Motor"*

# RAYFIELD

CARBURETORS

Suppose some one  
put a Model G  
Rayfield on your  
car without your  
knowledge—

When next you touched the throttle you would wonder what elixir of life had been breathed into your motor.

You would find in it a new power, a quicker response, a steadier pull and an abundance of energy that would give you a new idea of what your motor could do.

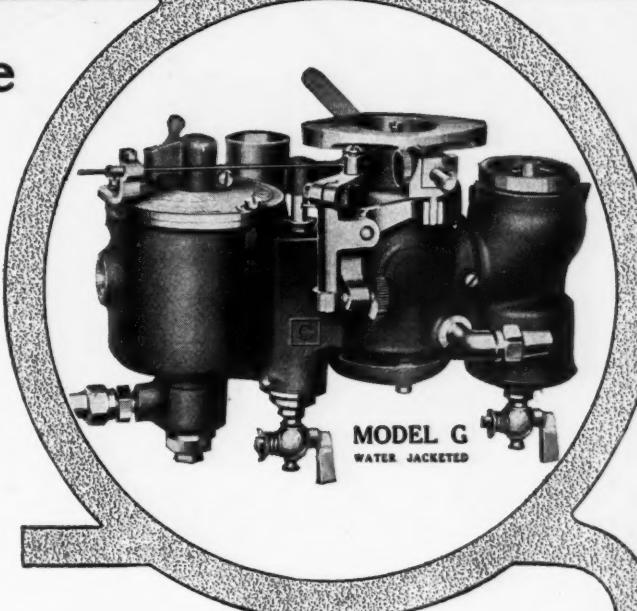
But you would be using from 10% to 50% less gasoline and you could throttle it down to a beat as slow as your pulse.

It doesn't matter what car you are driving either, or what carburetor is on it, or what mileage you have been getting to a gallon of gas; the Rayfield opens up a new kind of motoring.

The Model G has only two simple adjustments and can easily be installed by any good mechanic. Dealers find it profitable to handle because it gives unusual satisfaction. We would be glad to advise you about what you could expect to do with it in your territory. Write us.

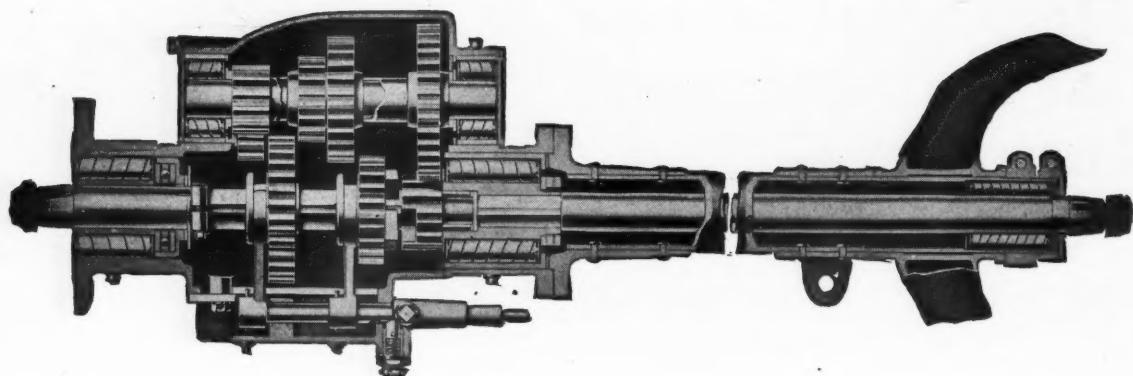
**FINDEISEN & KROPF MFG. CO.**  
2109 Rockwell Street CHICAGO, ILLINOIS

BRANCHES: 1140 Michigan Ave., Chicago 1211 Woodward Ave., Detroit 1902 Broadway, New York





# COVERT TRANSMISSIONS

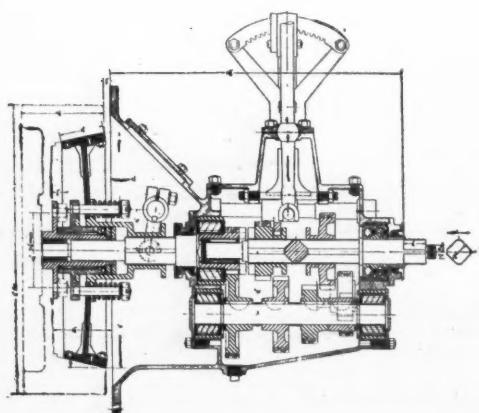


## A Quality Product

COVERT TRANSMISSIONS are not merely good transmission but the best that modern engineering skill and knowledge can fashion out of the highest grade of materials. They are essentially a quality product designed particularly for those motor car and truck manufacturers who are satisfied with nothing but the best.

That COVERT TRANSMISSIONS are a distinctly quality product is shown by the many successful builders who have incorporated them in their cars and trucks and have found in them the most satisfactory solution of their transmission problems.

It is worth your while considering the adoption of COVERT TRANSMISSIONS for the cars you build. Specialized engineers are at your service to adapt COVERT TRANSMISSIONS to your construction.



**Covert Motor Vehicle Co.**

Factory: Lockport, N. Y.

Sales Office: Detroit, Mich.

*The Choice of*  
**The Successful Dealer**  
*is*  
**The Public Choice-**  
**He Knows a Good Motor Car**

**T**HE business men who make money selling motor cars are keen students of up-to-date engineering practice and design.

They visit the factories, study the trade journals, and analyze public demand. Jeffery dealers are successful business men. Their opinions are sought by the buying public because they sell a product manufactured by a leader in the industry.

The wise buyer takes advice only from the man who knows.

The Thomas B. Jeffery Company



# Successful Dealers See



From our very pleasant experience in handling the Jeffery Four and Jeffery Six in 1914 we believe that the Jeffery Chesterfield Six is one of the finest cars ever placed on the market. We believe that the Jeffery organization is the finest ever and that the American public will have to SEE the Jeffery line for 1915.

J. Scott Hurley  
Philadelphia, Pa.

The Jeffery line for 1915 is a little better than anything else on the market. I have looked over a great many different lines of 1915 cars and I haven't seen anything that will sell for anything like this price which really has the quality in it. The quad truck demonstrated this morning is going to revolutionize the truck business entirely. I am not surprised that the government adopted it, as it is really the only truck made that will follow the route that it will. Without question the Jeffery line for 1915 is the line and the Four is a little wonder. I think so much of it that I am taking one home with me today.

Chas. H. Frazier  
South Bend, Ind.

The results obtained from the Four have been so far beyond my expectations that it seems hardly possible to improve on it, but the general performance and appearance of the Jeffery Chesterfield Six has created in me an enthusiasm that I am unable to express.

These two cars with the others make up a line that any dealer may consider himself proud to represent.

F. A. Winerich  
San Antonio, Texas.

I have attended the Jeffery Convention of dealers and about all I can say is that I feel sorry for any dealer in the United States who knows what the Jeffery 1914 and 1915 models are and is not in position to secure this agency. My opinion is that both the pleasure cars and trucks are the most perfect samples of automobile manufacture that has ever been my good fortune to see.

The Jeffery organization, both productive and selling, is in keeping with the car—that is, is as near perfect as is possible for such an organization to be.

A. M. Robbins  
Chicago, Ill.

The beautiful lines and unusual riding qualities of the Jeffery Chesterfield Six model, coupled with the ample power and ability to stop this season. It embodies all of the wonderfully fine features of the Jeffery Four, which has been extremely successful during the entire season, and with the new features, such as the spring construction and worm drive, will make this an ideal car for a man desiring a six cylinder car of quality.

The new quad chassis, which has been equipped with a combination hose and chemical body and delivered by us to the City of Chippewa Falls, is a marvel of power, strength and flexibility. No able comment and it is without doubt several years ahead of anything on the market.

F. A. Bigler  
Chippewa Falls, Wis.

After carefully examining all the different up-to-date models and reading a description of the best-made European cars I am fully convinced that for up-to-date automobiles Jeffery has got it on any concern in this country.

H. R. Nelson  
Lena, Ill.

In my 14 years of experience as an automobile dealer have attended a great many dealers' conventions held by some of the most prominent and successful automobile manufacturers in the industry. I have never attended a convention that was conducted any better or where there was as much enthusiasm shown by the dealers as at this convention.

I believe that the different models represented in the Jeffery Four, the Jeffery Chesterfield Six, Big Six and in the trucks are the greatest values produced today by any factory in the United States.

J. A. Cramer  
Buffalo, N. Y.

The two days convention at Kenosha at the Jeffery factory satisfies me that in the Jeffery line we have the greatest line of motor cars ever produced. The new addition, the Jeffery Chesterfield Six, just rounds out the line. The Four is a wonder, mention of the beautiful big Six is unnecessary and the addition of the Chesterfield Six assures me that I can return to Milwaukee confident that the 1915 selling season will be the best in my history. The spirit of the Jeffery organization is wonderful and one cannot help but be seriously impressed with the fact that the onward movement of the Jeffery will stop at nothing but leadership.

Al Reeke  
Milwaukee, Wis.

The Chesterfield Six I consider is the Light Six of the year. In style, comfort, power and simplicity of operation, comparing with other Sixes the high grade quality of the Chesterfield stands paramount. The convention can't help but reflect credit on an organization such as the organization of the Thomas B. Jeffery Company.

Jos. H. Greenwald  
Cleveland, Ohio

## MEN WHO SUCCEED

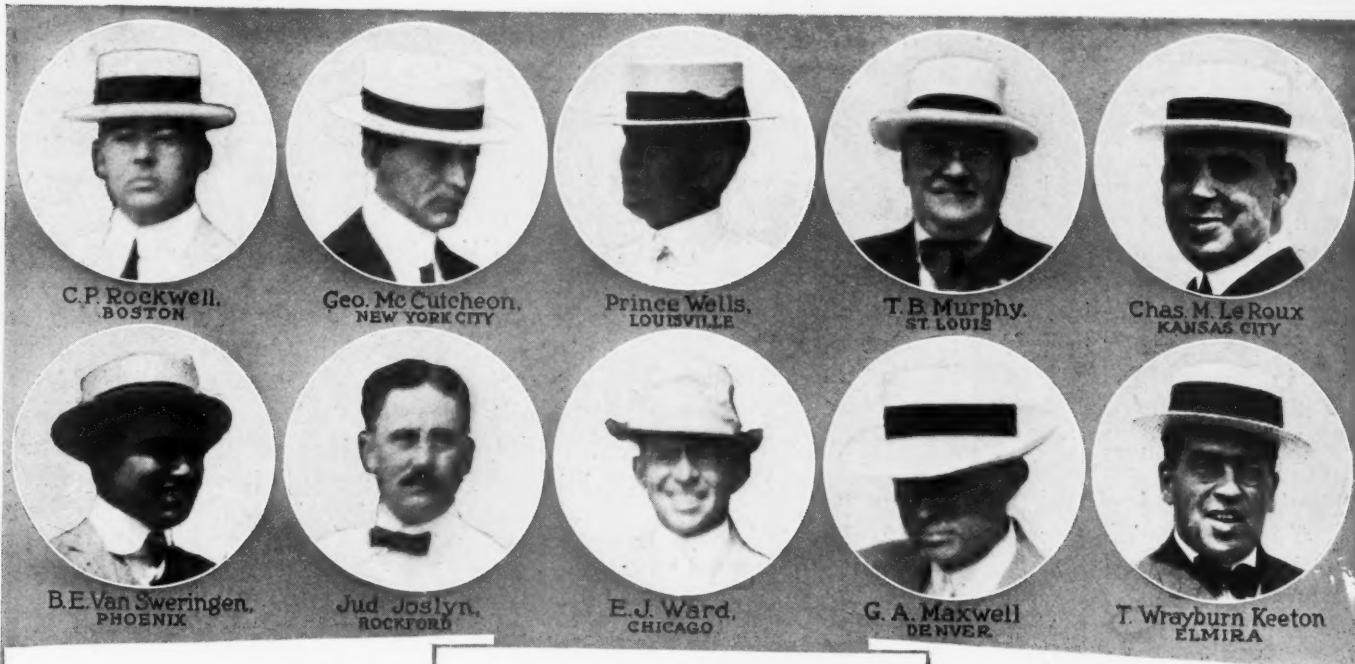
HERE are a score of the business men who sell Jeffery cars. Some of them have sold the Jeffery product for twenty-five years; others have just recently linked their success with ours.

There are scores of other loyal dealers, equally necessary to Jeffery success. There seems to be no difference in their enthusiasm. If the Jeffery Four had not been a mighty popular car—had it given any trouble in the hands of the user—these men would not be so loyal to it now that a new model has been introduced.

They would not have mentioned it in their letters. They were able to meet competition with the Four and come away with the order. That's what creates enthusiasm which is doubled when the car makes good.



# Big Business in Jeffery Cars



I am thoroughly satisfied with the Jeffery line for 1915. The Chesterfield Light Six is in a class by itself. I couldn't suggest an improvement and the trucks will be a sensation. The performance of the Quad was wonderful and quite unbelievable to one who hasn't seen it.

C. P. Rockwell  
Boston, Mass.

*C. P. Rockwell*

After comparing all advance information obtainable I have decided your line to be foremost on the American market. Your line of touring cars, consisting of the Four with the most enviable reputation, the Chesterfield Six and the Big Six, which with the refinements for 1915 is now superb, supplemented with the truck line now ready for delivery, makes a proposition which no live dealer can overlook, and the fact that you have my contract for so large a number of cars is corroborative evidence of the above.

Jud. Joslyn  
Rockford, Ill.

*Jud. Joslyn*

I wish to be among those who express themselves by the already time worn statement, "It's a wonder." The Chesterfield Six embodies all that may be expected in a car. This car typifies the latest in comfort and superior quality which gives the Packard the pre-eminence in its class, and we are glad to have the two cars—the Packard and Jeffery—associated in our work.

B. E. VanSweringen  
Phoenix, Ariz.

*B. E. VanSweringen*

I wish to thank you for the treatment I have received since I have been attending the convention at the Jeffery factory. There never has been a convention, in all my experience, that has been such a success.

I am more enthusiastic than I ever have been over the Jeffery line. I have always been over the Jeffery.

The Jeffery Four has been unsurpassed. I have sold 52 cars with not one dissatisfied owner and I am sure that the Chesterfield Six will be a worthy companion of the Jeffery Four.

T. V. Murphy  
St. Louis, Mo.

*T. V. Murphy*

For comfort, economy, style, beauty and power, the Jeffery Chesterfield Six far surpasses any car I have ever seen. Its excellence, coupled with that "keep-ahead-of-'em" spirit of the entire Jeffery organization gives the dealer something tangible upon which to build a permanent business and I consider it a privilege to be in the dealer's organization.

C. M. LeRoux  
Kansas City, Mo.

*C. M. LeRoux*

During the two days spent at the dealers' convention at the Thomas B. Jeffery Company's factory, I looked over the Chesterfield Six and I find that the Chesterfield Six is ahead of any other car at anywhere near its price—very superior in a great many features, especially the very easy riding qualities. I saw feats performed with the Quad truck that in my judgment would be impossible to perform with any other truck on the market today at any price.

I have sold T. B. J.'s product for six years and believe at the present time that they have the easiest selling proposition on the market. With this line it will be easy sailing for the up-to-date dealer.

Dexter Stocking  
Rochelle, Ill.

*Dexter Stocking*

If I were going to build an ideal car, the Chesterfield Six would meet all my ideals. I see nothing to criticise and everything to praise.

The performance of the Four Wheel Drive this morning is beyond belief without seeing it. It will certainly do everything except talk.

Considering the Jeffery Four and Six our business will certainly exceed for 1915 any previous year and I am increasing my orders accordingly.

Prince Wells  
Louisville, Ky.

*Prince Wells*

The Jeffery organization is without any question the most wonderful organization I have ever visited. The line above all expectations. The new Chesterfield Six is the most wonderful style carriage I have ever ridden in.

The demonstration of the Quad truck this morning is almost unbelievable and I see a great future for this truck.

It was after giving all these matters due consideration that I finally decided to take on the Jeffery line in preference to any other line on the market.

G. S. McCutcheon, Brooklyn, N. Y.  
Poernter Motor Car Co. of N. Y.

*G. S. McCutcheon*

We owe our success naturally to the Jeffery Four. At the present time we have no suggestions or changes to be offered in this particular car, and are thankful that the Jeffery Company have seen their way clear to continue this car in its present state for 1915.

In my opinion the new Jeffery Chesterfield Six has everything else backed off the map.

W. W. Ingram  
Rutland, Ill.

*W. W. Ingram*

## STUDY THEIR BUSINESS

THESE men know that the new Jeffery Chesterfield Six is an assured leader among economical Sixes because Jeffery built it. Because it contains the same high grade materials that made the Four an acknowledged leader.

Because it's ahead in engineering design—worm drive, high speed, high efficiency, European type motor, Cantilever springs, Vanadium steel parts, etc. Because it is distinctively beautiful—a style carriage—has individuality which appeals immediately to people of good taste.

Because it is economical and comfortable. If these men knew only Jeffery cars, if they visited the Jeffery plant alone, their opinions would not be worth much. It's the fact that they are students of the motor car industry, familiar with all leading cars and all the leading plants and assembling shops that wins for them the public confidence.



## A Few Features of the Highest Grade Moderate Priced Four and Six Cylinder Cars on the Market

### FAMOUS JEFFERY FOUR

Motor, high speed, high efficiency, en bloc,  $3\frac{3}{4} \times 5\frac{1}{4}$ , 38 H. P. Starting-lighting, U-S-L. Bearings, imported annular, ball. Transmission, four speed forward and reverse. Rear axle, full floating. Valves, Rich Tungsten steel. Clutch, cone type. Ignition, Bosch Duplex. Daimler leather couplings, Spicer Universals, Vanadium steel parts. Lubrication, combined force feed and splash. Rayfield carburetor. Left drive, center control. Wheel base, 116 inches. Weight, 2850. Tires, 34 x 4. Equipment complete. Top, rain vision wind shield, Klaxet horn, Stewart-Warner speedometer, ammeter, pump, jack, full set of tools, etc. The car that changed the trend of motor car design in America—the first high grade, light weight, economical car of distinctive beauty and with the easy riding qualities of the big, expensive cars. Price, \$1450.

### THE CHESTERFIELD SIX

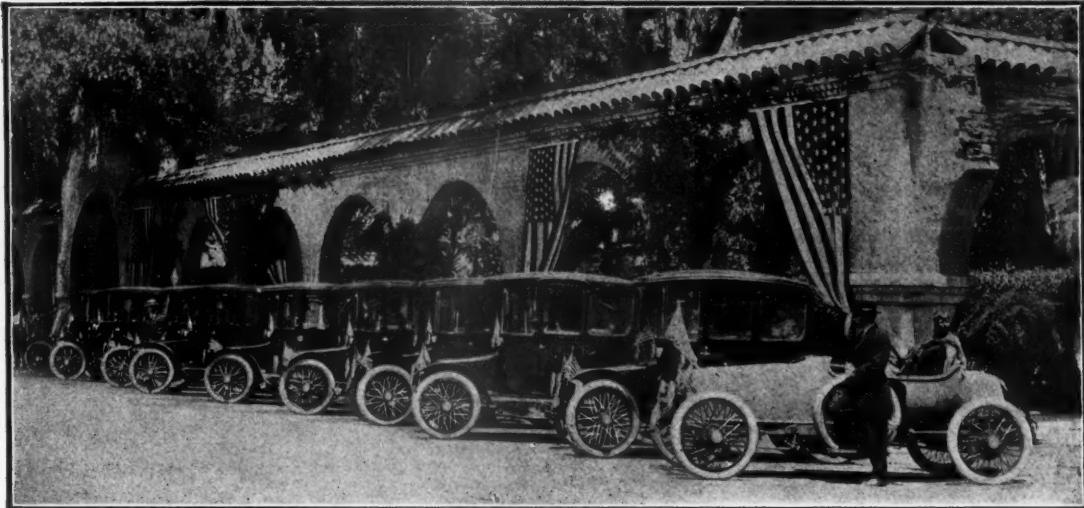
Motor, high speed, high efficiency, L head, six cylinder, bloc type, 3 x 5, weight 397 pounds. 35-42 H. P. Worm drive, full floating rear axle. Imported annular ball bearings. Bijur starting and lighting system. Four speed and reverse transmission. Cantilever springs. Bosch ignition, cables and plugs. Lubrication, combined constant splash from gravity feed operated by Vane pump. Three plate dry disc clutch. Rich Tungsten steel valves. European type cellular radiator, pump circulating cooling system. Cylindrical, seamless gasoline tank carried in rear with Stewart vacuum feed to Rayfield carburetor. 34 x 4 tires; wheel base, 122 inches; weight, 2850 lbs. Full French streamline Chesterfield body. One man top and complete high grade equipment. Price \$1650.

The Jeffery Big Six, with Chesterfield body, built from the same high grade materials and equipped complete, \$2400. Wheel base  $133\frac{1}{2}$  inches, 36 x 4½ tires. Weight, 3700 pounds.

*Jeffery Motor Trucks—Three Quarter Ton—One and One Half Ton—Jeffery Quad*

**The Thomas B. Jeffery Company**  
Main Office and Works, Kenosha, Wisconsin





*Houk Wire Wheels on Beardsley Electric Cars in front of famous Mission Inn, Riverside, Cal.*

## *Note the Houk Wire Wheels*

Every day more cars are to be seen equipped with Houk Wire Wheels. Fleets of Houk-equipped cars like that illustrated above are by no means rare.

The development of the wire wheel has been the big thing of the year. In another year or two a car without wire wheels will be as antiquated as a car without a self starter.

Don't buy a car that in a short time will be out of date and consequently will not have its proper value. Insist on the leaders

# HOUK

Detachable  
Wire Wheels

*Made in Sizes to Fit all Cars*

Manufactured by the World's Largest Wire Wheel  
Makers, Houk Mfg. Co. for Geo. W. Houk Co.,  
1702 Elmwood Ave., Buffalo, N. Y.

*USE THIS COUPON*

Geo. W. Houk Co.  
1702 Elmwood Ave.  
Buffalo, N. Y.:

Without obligation on  
my part send me cata-  
logue and prices on Houk  
Wire Wheels for a

Model ..... car

Name .....

Address .....

# How to Get the Full Measure of Enjoyment from Driving Your Ford

HERE are the reasons why the regular Ford ignition system gives you the troubles it does:

First—*It is practically impossible to tune the four coils on a Ford car so they will work synchronously and give an efficient spark.*

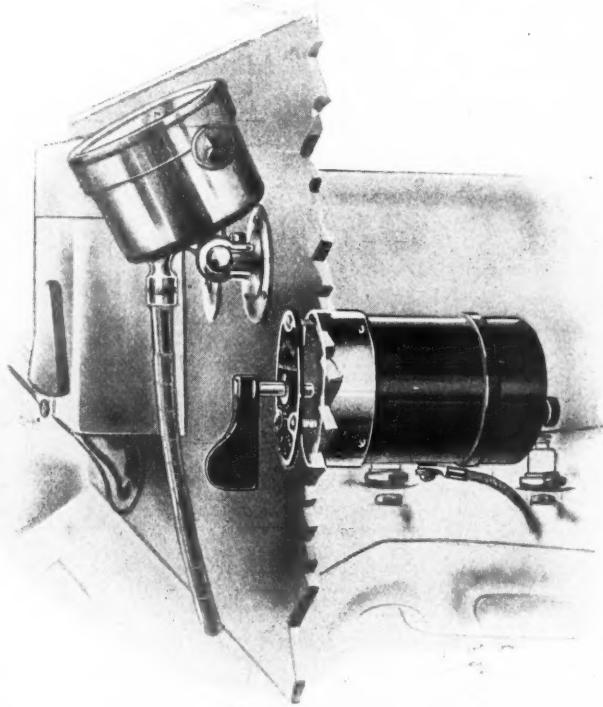
Second—*In spite of constant adjustments Ford ignition troubles come right back because the coils themselves are not adapted to handle the alternating current a Ford Magneto produces.*

In marked contrast with this inefficiency the Connecticut Master Vibrator not only makes your motor run more smoothly and quietly, develop more power and flexibility and not only does it make starting easier but shows such remarkable economy on the amount of current it consumes

for ignition that the quality of your lighting is greatly improved.

This instrument was designed especially for use on Ford cars and gives its greatest efficiency when working in conjunction with a Ford fly-wheel magneto.

The Connecticut Master Vibrator is the smallest instrument of its kind on the market and is equipped with a neat form of switch which fits flush with the dash, exposing nothing but its switch.



CONNECTICUT

*The installation of a Connecticut Master Vibrator on your Ford is so simple that you do not require the services of a mechanic to put it on. Simply bore four holes through the dash—three for the screws and one for the switch rod, follow the wiring diagram carefully and that is all there is to it.*

Remember the price of the Connecticut Master Vibrator—\$9.00—is in proportion to the size of the instrument. Its efficiency is in proportion to the reputation for quality Connecticut products have gained.

Go to your dealer—or order direct if he cannot accommodate you. Price \$9.00 complete.

Every Connecticut Master Vibrator is fully guaranteed.

**CONNECTICUT TELEPHONE  
AND ELECTRIC COMPANY**  
**MERIDEN, CONNECTICUT**

# Studebaker

THE Studebaker dealer invariably places his competitors on the defensive. He realizes that the many advantages the manufactured automobile offers over the partly manufactured car are the strongest selling arguments that can be used.

He knows that every piece of steel that enters the Studebaker plants is purchased according to special Studebaker formulas.

He knows that Studebaker steels are all heat treated in Studebaker plants.

He knows that Studebaker builds, finishes and upholsters all Studebaker bodies.

He knows that Studebaker manufactures the Studebaker motor—probably the most efficient and accessible motor in the world.

He knows that, with the exception of the electrical system and the Timken Bearings, all parts of Studebaker cars are made by and within the Studebaker plants.

With these strong selling arguments at his disposal, the Studebaker dealer invariably occupies the dominant position in his community.

Owing to the necessity of dividing and subdividing territory, we can still use the services of a few capable and experienced dealers in various sections of the country.

Write, wire or call at the Studebaker plants for complete information.

Prices F. O. B. Detroit  
 Four Roadster... \$ 985  
 Four Touring Car 985  
 5 Passenger Six.. 1385  
 7 Passenger Six.. 1475

We extend a cordial invitation to all dealers when in Detroit to inspect Studebaker plants.

## STUDEBAKER, Detroit

**5 Passenger  
SIX  
\$1385**





## We Believe In Protection (*No Politics In This*)

Facts first—wires carrying current to spark plugs, lamps, starter and horn have rubber between the strands (the core) and the outside braids. This rubber cannot escape the rotting action of oil and grease, rubber's worst enemies—unless protected—and braids are mighty little protection.

### Our Chemists Have Produced a "Protector" That Protects

It's a substance unlike anything you ever saw—elastic and "rubbery" in general appearance, but not like rubber when subjected to oil or grease.

We Practice What We Preach—When Making

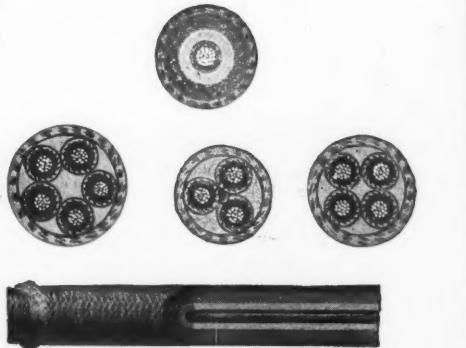
**Packard**

### Protected Cable

This "protector" is applied to each individual conductor and to the completed cable in the form of a very light enamel which fills and closes every pore, successive coats being added until the rubber is sealed with an oil-proof covering—a kind of elastic "skin" which in no way injures the rubber or affects the cable's flexibility. Protection against oil is thus built into the cable—and because oil is ever-present on an automobile or motor boat

**We Believe In Protection**

27 styles, for Ignition, Starting and Lighting, always ready for immediate delivery.  
All protected.



Combination High Tension Cable



**The Packard Electric Company**  
Dept. C, Warren, Ohio

(100)

## "Your Money's Worth" And Its Firestone Meaning

WHATEVER is your standard of the worth of your money in tire equipment, Firestone Tires, Tubes and Rims answer it.

If you measure by the number of miles your tire will wear, the actual life of the tread, your standard demands the Firestone endurance.

If easy riding for comfort and car protection is your first essential, the Firestone resiliency will supply it. Firestone Tires are alive. The new pure para rubber of highest grade forms a tread with that "give and take" elasticity which absorbs the little irregularities of the road.

# Firestone

## Tires and Rims

If your "money's worth" means first of all confidence, you need the security that is built into every Firestone Tire, a security which makes all mechanical devices as needless as they are expensive. You will appreciate the extra non-skid tread with its gripping angles, meaning insurance against accident, also better traction, gasoline economy. You'll need the secure, easily handled Quick Detachable Demountable Rims

and the friction-resisting Inner Tubes.

Whatever specific value you are seeking you will find in fullest measure in Firestone—the every season, all around, full service tire equipment.

Firestone principles have been proven right. They have lived up to every test of road and weather.

Don't compromise. Get the tire equipment, which, by every standard of value, measures—

### Most Miles Per Dollar

*Specify them or purchase them through any leading dealer.*

**Firestone Tire and Rubber Company**  
Akron, Ohio—Branches and Dealers Everywhere  
"America's Largest Exclusive Tire and Rim Makers"



# Maxwell 25"

The biggest automobile value ever offered for less than \$1,000.  
Our production of 60,000 cars makes the new price of  
\$695 fully equipped (with 17 new features) possible.

- 1—Pure stream-line body.
- 2—Adjustable front seat.
- 3—Sims high-tension magneto.
- 4—Three-quarter elliptic rear springs.
- 5—Tire brackets on rear.
- 6—Spring tension fan.
- 7—Kingston carburetor.
- 8—Clear Vision Wind Shield.
- 9—Foot-rest for accelerator pedal.
- 10—Concealed door hinges.
- 11—Gasoline tank located under dash cowl.
- 12—Crown fenders with all rivets concealed.

Automobile experts have refused to believe that anyone could produce a full grown five passenger really beautiful fully equipped car—a car with real high tension magneto—a car with sliding gear transmission—left hand drive center control, a car with practically every high priced car feature for less than \$1,000.

Here it is. Here is a real automobile. Here is the easiest car to drive in the world—here is the greatest all around hill climbing car in the world. Here is an automobile to be really proud of.

With Electric Self-Starter and Electric Lights \$55 Extra.  
See this "Wonder Car" at the Maxwell dealer nearest you. Write at once for the beautiful  
1915 Maxwell Catalog.

Dept. E.

MAXWELL MOTOR CO., INC., DETROIT, MICH.

**\$ 695**

**With Electric Self Starter and Electric Lights \$55 Extra**

*When Writing to Advertisers, Please Mention Motor Age.*

**CAMPBELL**  
ESTABLISHED 1879

**Guaranteed  
Motor Car  
Accessories**

**Dealers:**

Looks sell the car—  
Campbell Seat Covers  
furnish the looks.



**Car Owners:**

Campbell Seat Covers  
are cool and comfort-  
able this hot weather.

Nothing adds to the looks and comfort of a car like Campbell Seat Covers. They "tone it up" and add the finishing touch of class; they are cool and comfortable; make touring a pleasure.

**CAMPBELL WATER PROOF SEAT COVERS**

are the best that money can buy. They are water-  
proof and can be easily cleaned with Percama.  
Every set is guaranteed to fit like a good custom  
tailored suit would fit you; and Campbell Seat  
Covers will not stretch out of shape or fade like

so many cheaper imitations. Insist on Campbell  
Seat Covers. Remember we guarantee satisfac-  
tion. Three grades: Water-proof Jeans, Genu-  
ine Mohair, Clean-Ezy. Write for samples and  
prices.

Get the  
Campbell Agency

Write for catalogue of other Campbell Accessories  
THE PERKINS-CAMPBELL CO., 624 Broadway, Cincinnati, Ohio

Have You Seen Our  
Ford Line?

**Clean Dirty Tops and  
Seat Covers! EASY!**

There is no longer any excuse for  
greasy, dusty tops and seat covers. Per-  
cama, the new heavy fabric cleaner made  
by Campbell, takes out all the dirt and  
restores the original lustre and bright-  
ness.

**Percama**  
CLEANS HEAVY FABRICS  
Trade-Mark Registered  
MADE BY CAMPBELL

Percama contains no explosive, no gasoline or ben-  
zine. It is safe, sure. It will not harm leather or  
rubber, does not affect water-  
proofing in double texture cloth.  
Cleans carpets, rugs, upholster-  
ing, linoleum, in addition to  
automobile tops, seat covers,  
etc. One quart is enough to  
clean the seat covers of a large  
touring car.

**Dealers**—Write for our sales  
proposition. It's a big money  
maker for you.

**Car Owners**—If your dealer can-  
not supply you with Percama,  
write us and we will see that you  
are supplied. Write for folder.

Quart, 25c Half Gallon, 40c Gallon, 60c

THE PERKINS-CAMPBELL CO.  
624 Broadway Cincinnati, Ohio

**"Campbell makes sure you're satisfied"**

**Ends Carburetion Troubles  
For Fords**

No more choking motors at critical moments;  
no more continuous tinkering to keep your  
carburetor working; no more adjusting for  
weather conditions; big saving in gasoline bills.

The new Johnson Carburetor eliminates all  
this and turns Ford Motors into sweet-running  
sixes—365 days in the year.

**Johnson Carburetor \$12**  
Guaranteed by Campbell

Ready to  
Attach

*This wonderful carburetor*

1. Is remarkably simple.
2. Has no springs.
3. Is absolutely automatic in action.
4. Can't choke motor at any speed.
5. Throttles down to five miles per hour on high.
6. Accelerates 25% faster than any other carburetor.
7. Saves gas.
8. Is not affected by weather conditions, summer or winter.
9. Can be put on your Ford without changing manifold, control rods, or boring or drilling a single new hole.

**Dealers and Ford Owners:** Write for folder giving detailed description of the Johnson Carburetor. You can't afford to pass this sensational new accessory without investigating it. Address

THE PERKINS-CAMPBELL CO.  
624 Broadway Cincinnati, Ohio

# Single Thickness Seat Cover Fabric

## DISCUSSION NUMBER TWO



**WEAR**, appearance, and the fact that it can be cleaned are the three chief requirements of a perfect seat cover cloth, and these three features exist in an unqualified degree in Laidlaw Burbank Seat Cover Cloth.

Laidlaw Burbank Seat Cover Cloth is one solid piece with the wear distributed throughout, from the face right through to the back. It is closely and firmly woven. It is free from rubber compositions and can therefore be cleaned with gasoline without injury.

The usual seat cover material is made of two thin pieces of cloth cemented together with a rubber interlining composition, each cloth so thin that you can plainly see through it. The outside cloth which is expected to sustain all of the wear is usually a piece of dress goods, entirely unsuited for the severe usage and abuse to which seat covers are subjected, first, because it is harsh and wiry and therefore wears your clothing, and, second, because it is much too thin to render even a small part of the service reasonably to be expected of a seat cover, and it consequently wears through and exposes the rubber composition interlining. It is practically impossible to wear out a set of seat covers made of Laidlaw Burbank.

The superb wearing quality of Laidlaw Burbank Seat Cover Cloth is admirably sup-

plemented by the fact that it can be cleaned with soap and water or gasoline, without injury, making it possible to always keep Laidlaw Burbank seat covers fresh and bright.

Because of the presence of rubber composition in the usual seat cover materials, it is impossible to clean them, because gasoline dissolves the rubber.

Every automobile manufacturer, dealer, body builder, and seat cover maker should know about the merits of Laidlaw Burbank Seat Cover Cloth. Full particulars and samples will be sent upon request.

*The*  
**Laidlaw  
Company  
Inc.**

126-32 W. 46th Street  
New York N. Y.

# TIMKEN

## BEARINGS & AXLES

### Know Motor Car Values

To *know* motor-car values you need to know the values of the parts.

Because the motor car is a machine. And its use-service-value depends upon the rightness of its component parts.

No parts are more important to know than the bearings—because they safeguard the other vital moving parts that give "life" to the car.

**Where the Bearings Are:** On the axle spindles in the hubs of all four wheels, in the steering knuckle heads, in the transmission, on the pinion shaft, each side of the differential—these are the hard service places where only the best bearings will stand up to year-after-year use.

**What the Bearings Must Do:** Bearings must reduce friction to almost nothing—all good anti-friction bearings do this. They must sustain the vertical load and the sudden increases in that load that come with rapid travel over rough road surfaces. They must meet severe end-pressure along the line of the shaft, a force that often exceeds vertical load.

Weight of car and passengers or freight pressing down on wheel bearings is a good example of vertical load. "Mass-momentum" of car and contents pressing sideways against the wheels as you round a corner is a good example of end-thrust. Keep both vertical load and end-thrust in mind as you read further.

**Types of Bearings in Use:** Anti-friction bearings may be divided into two general groups—Ball Bearings and Roller Bearings. These groups may be subdivided thus:

Ball Bearings      Roller Bearings  
1. Annular      2. Cup-and-Cone      3. Straight      4. Tapered

The illustrations show an example of each of the four kinds. From the text with the pictures you will note these interesting facts:

(a) A roller carries more direct load in proportion to its diameter than a ball because it carries the load along a line instead of on one or two mere points.

(b) Annular ball bearings have very little capacity for end-thrust, and straight roller bearings none and they cannot be adjusted to take up wear. Hence, they are often used with additional thrust bearings, and when sufficiently worn, they must be replaced with new bearings.

(c) Cup-and-cone ball bearings meet end-thrust to some extent but only at great sacrifice of capacity for vertical load.

(d) Cup-and-cone ball bearings can be adjusted—but this does not restore full efficiency because the slightest wear destroys the proper curvature of the ball race.

(e) Tapered roller bearings have greater capacity for both vertical load and end-thrust. Pressure is distributed over wide surfaces, hence wear is minimized. The slight wear inevitable in any bearing cannot affect the taper of cone, rollers or cup. Therefore, simply moving these parts into slightly closer contact with each other brings cup, rollers and cone into the same relations that existed before the minute wear occurred. This "adjustment" restores the tapered roller bearing to full efficiency.

**The Conclusion is Irresistible:** What's more it is backed by the experience of several hundred thousand motorists with Timken Tapered Roller Bearings at the points of severest service in the great majority of high-grade motor cars.

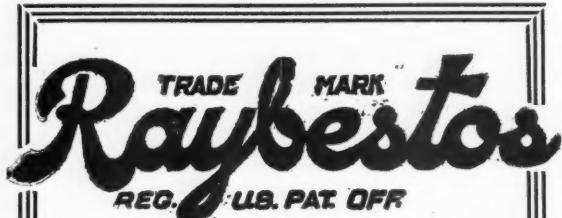
The story of bearings and axles is told in an interesting, human sort of way in three Timken booklets, one "On Bearings," another "On Axles," a third "The Companies Timken Keeps" which tells where Timken Bearings and Axles are located in each model of Timken-equipped pleasure and commercial cars. Write for these three Timken Booklets to Department T-5, either Timken Company. They'll be mailed to you free. No follow-up, no salesman will call. Write today.



The Timken Roller Bearing Co.  
Canton, Ohio  
The Timken-Detroit Axle Co.  
Detroit, Michigan



# The Only Brake Lining Good Enough to Guarantee



Raybestos Brake Lining is the only lining sold under a definite guarantee.

Why?

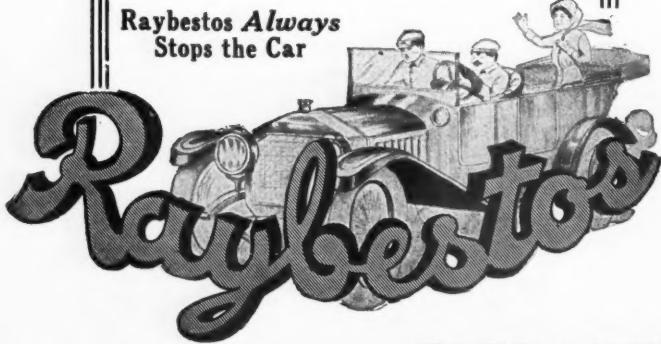
Because our years of experience, secret process and established standards enable us to be **sure** of the wearing qualities of our product—while other makers have to guess about theirs.

A full year's wear on the car, or new lining without charge. This is your guarantee when Raybestos is put on your brakes. It protects your safety—and your pocketbook.

You can get Raybestos from any dealer if you insist. You'll know it by the name, stamped on every foot, and its silver edges. Don't allow an imitation to be substituted. You have too much at stake.

The Royal Equipment Co.  
1352 Bostwick Avenue  
Bridgeport, Conn.

**Raybestos Always  
Stops the Car**



*When Writing to Advertisers, Please Mention Motor Age.*

## Make Your FORD Self-Starting!

Never worry again about backfire—forget the discomfort of the broiling sun or a drenching storm—sit in your seat, push a foot-pedal and your engine goes.



## The Century Ford Starter

is as simple as A, B, C. Light, compact, under the hood, out of sight—yet powerful enough so that even a 16 or 18-year-old can start easily, safely and surely every time. Turns over the engine twice as fast with very little effort.

### "Safe and Sane" Starting for Every FORD Owner

This Starter frees you and your family from all danger of strain or injury from backfire—from the one great "kill-joy" of Ford motoring—by making your FORD as safe and as complete as high priced cars. And all at a price that is genuinely reasonable.

**\$25 Complete With \$25  
All Connections**

This includes starter, foot-pedal, connections—everything complete so as to install on your FORD in an hour's time without alterations. Send for complete information—better yet, order now—because the first few hundreds of these starters have created such a demand that our twice-enlarged factory is barely able to fill orders.

**The Century Foundry Co., Inc.**  
1622 N. Salina St., Syracuse, N. Y.

## Two-to-One

that this fellow doesn't do work like this next year. He'll buy a Kellogg Pump or he'll buy a new car that has a Kellogg as standard or special equipment. This list shows his choice:

CHANDLER	IMPERIAL	PACKARD
FIAT	JACKSON	PEERLESS
FRANKLIN	LEXINGTON	SPEEDWELL
HAVERS	LOZIER	STEARNS
HOWARD	MICHELL	STEVENS-DURYEA
		WINTON



Or he'll buy one of these cars because he can get a Kellogg with special attachments that any dealer can install.

ABBOTT	HENDERSON	PIERCE
BUICK	HUDSON	REO
CADILLAC	MAXWELL 6	SIMPLEX
CHALMERS	OAKLAND	STUDEBAKER SIX
COLE	OVERLAND	STUTZ

There are many other cars for which we have made attachments and for which we are building special pumps.

# Engine Driven KELLOGG Air Pump

One, Two, Four, Six Cylinder Models

One of the great advantages of the Kellogg Pump on your car is due to the fact that we have been making pumps with **special attachments** for so many years now that we know just what problems we have to contend with in every type of car for which we build equipment. Over 56,000 of our four-cylinder pump, for example, have been sold within the past six years. Lift up the hood of most any of the cars named above and you will find that the pump makes a neat attachment—

**"Fit Companion for Any Good Motor."**

We have kept ahead of present-day practice in that we have designed different styles of pumps for different requirements, just as we have built different attachments that our pump might be most efficient under all circumstances.

Write us about your requirements.

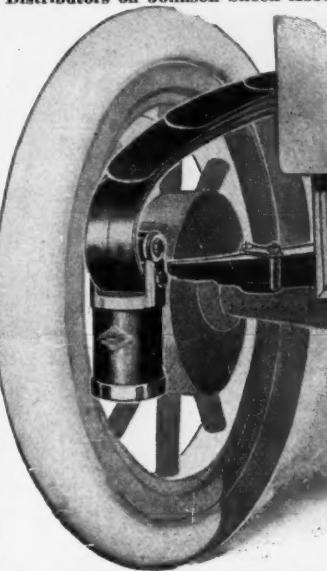
**Kellogg Manufacturing Co.**  
114 Circle St.,  Rochester, N. Y.

New York San Francisco Detroit Chicago  
Special Pumps and Air-Starting Units Made in Quantity for Manufacturers.

# JOHNSON SHOCK ABSORBER

**List of Distributors on Johnson Shock Absorbers**

Vesta Storage Co., 1718 Broadway, New York, N. Y.; Roberts Garage, Ltd., Newberry & Hereford Streets, Boston, Mass.; Ross Automobile Co., 20 Water St., Auburn, N. Y.; George Chisholm, 1113 Chapel St., New Haven, Conn.; Auto Specialties Co., 301 Abbott Building, Philadelphia, Pa.; Cunningham & Donahue, 4th and Corcoran Streets, Washington, D. C.; City Auto Supply Co., 108 Market St., Harrisburg, Pa.; Auto Utilities Co., 5017 Baum Blvd., Pittsburgh, Pa.; Alexander-Seenwald Co., 145 Edgewood Ave., Atlanta, Ga.; Johnson Shock Absorber Co., 1838 Euclid Ave., Cleveland, Ohio; Brant Bros. Chalmers Co., 409 N. Capitol Ave., Indianapolis, Ind.; South Bend Rubber Co., South Bend, Ind.; Tennessee Auto Co., Nashville, Tenn.; Chas. Abresch Co., 4th & Poplar Sts., Milwaukee, Wis.; Sales Co., 701 Wells St., Milwaukee, Wis.; Fitch Auto Supply Co., Peoria, Ill.; W. L. Shellabarger & Sons, Decatur, Ill.; J. B. Chambers & Son, Danville, Ill.; R. W. Jester, Ashtabula, Ill.; M. J. Butterfield, Wheaton, Ill.; E. A. Ford, Algonquin, Ill.; Messenier & Crawford, Marseilles, Ill.; Johnson Cut-off Wagon Mfg. Co., 110-118 Harlem Ave., Oak Park, Ill.; Berwyn Auto Co., Berwyn, Ill.; Vehicle Top & Supply Co., 3414 Lindell Blvd., St. Louis, Mo.; Mr. E. Gartner, 905 N. 20th Street, St. Louis, Mo.; J. N. Johnson Co., 915 Nicollet Ave., Minneapolis, Minn.; Central Auto Supply Co., Des Moines, Iowa; Des Moines Cycle Car Co., 106 W. 4th St., Davenport, Iowa; E. K. Mead, Colo.; A. Manton, Los Angeles, Cal.



## Make Your Own Boulevards

JOHNSON SHOCK ABSORBERS do what others only claim to do.

It takes two competitive equipments to do what Johnsons do.

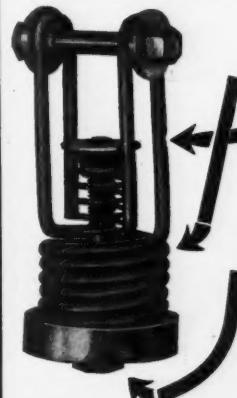
## Big Profits and Fast Sales

IF JOHNSON SHOCK ABSORBERS ARE NOT SOLD OR REPRESENTED IN YOUR CITY WRITE AT ONCE FOR DISTRIBUTORS' PROPOSITION AND TERRITORY. WE ARE CLOSING NOW FOR 1915.

A shock absorber designed and manufactured by spring specialists of years' experience, who know from first hand the failure of leaf springs to give maximum ease of riding under all load and road conditions.

The only spring shock absorber with a positive recoil check, and which adjusts itself to load changes. Has the only sure adjustment for extreme load and road conditions without detracting from the results of the absorber.

**Saves 25 to 50% in tire bills, minimizes spring breakage and prolongs the life of the car**



Two massive intercoiled spiral springs of the finest tempered alloy steel which carry the load and absorb the severest shocks.

Inside of these is a slightly lighter coil which takes the lighter shocks and eliminates the recoil.

At the bottom of the case is a nut by which an adjustment covering a radius of 1000 lbs. can be made in thirty seconds by two or three turns with a wrench or pliers.

**Triple Action Spring Co.**  
59-61-63 E. 28th St. Chicago

# Wayne

## Oil Pumps and Tanks For All Purposes At All Prices



Whether a private owner or a public garage man you need a Wayne Gasoline Pump, Oil Pump or Storage System. They spell safety, convenience and economy. They have 20 years' experience built into them. We are enabled to offer you finished guaranteed products.

Wayne pumps are the only absolutely rust-proof pumps on the market. Our line is complete. Comprises pumps of all kinds and sizes, at all prices, for all purposes. Suitable to either private or public garages. Wayne Gasoline and Oil Pumps are supplied in both portable and stationary models. Install a Wayne Storage System! Buy your fuel and oil in large quantities and take advantage of quantity prices.

Write for a list of prices and full descriptive literature.

**WAYNE OIL TANK & PUMP CO.**  
Fort Wayne, Indiana

Wayne Oil Tank & Pump Co., 730 Canal St., Ft. Wayne, Ind.

Gentlemen: Without expense or obligation send me prices and information on a Wayne outfit for the storage of

Gasoline .....

Oils .....

Kerosene .....

in

Private Garage .....

Public Garage .....

Factory .....

Store .....

Name .....

Street No. .....

City .....

State .....

When Writing to Advertisers, Please Mention Motor Age.

*Before  
and*



## A PROBLEM and its SOLUTION

It's no job to get a disabled car into the repair shop with a

## WEAVER AUTOAMBULANCE

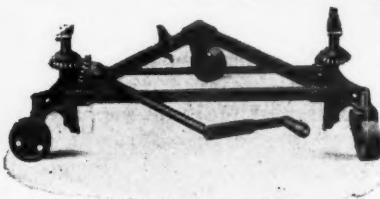
The repair man who repaired the car shown above MADE MONEY out of the job because he didn't eat up all of his profit getting the car into his shop. He used a WEAVER AUTO AMBULANCE, as shown below.

ROLLER BEARING Wheels have heavy roller bearings, and are amply high and wide for country road service;  $1\frac{1}{4}$ " steel axle; telescoping steel tongue; broad range of adjustment; strong, compact and easily handled.

**LIST PRICE \$30.00**

AND DONT  
FORGET—

## WEAVER AUTO TWIN JACKS



A combination of Turn Table, Transporting Truck, Lifting Jacks and Tire Rests. Will pay for themselves in a few weeks' service wherever autos are handled. Strongly constructed; ball and roller bearing; easily operated. Capacity, 4,000 lbs.; weight, each, 50 lbs.

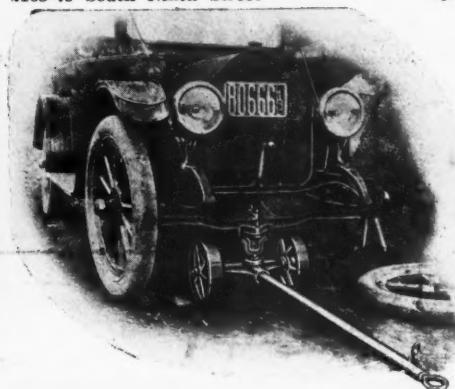
Two, one for each axle ..... \$20.00

Single Jack, as shown ..... 12.00

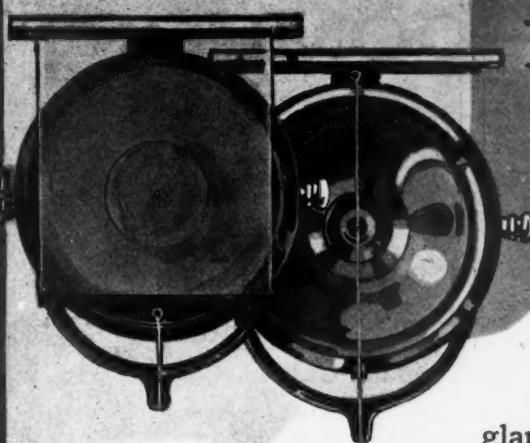
**WEAVER MFG. CO.**

2163-79 South Ninth Street

Springfield, Ill.



*After*



## REMOVE THE GLARE

from your headlights without lessening their power of penetration.

**SAFETY FIRST HEADLIGHT SHADES** operated from the driver's seat by means of a foot device enables you to change from the long range glaring light, so dangerous to your car and its occupants when you meet the other car on the country road, to a powerful mellow driving light with the glare absolutely eliminated. With the shaded light you also have powerful side lights enabling you to drive on a narrow dark country road with sharp curves clearly illuminated fifty feet on each side.

**SAFETY FIRST HEADLIGHT SHADES** comply with the demands of the ordinances passed and being passed in all prominent cities, relative to glaring headlights.

Approved by auto clubs and all city authorities.

Will penetrate fog or dust. Wind, rain or mud will not affect any part of the shade.

**THE SAFETY FIRST HEADLIGHT SHADES** can be attached to any make of car equipped with gas or electric headlights in one-half hour's time.

If your dealer will not supply you we will send you a complete set prepaid for \$10 with full instructions for installing.

Handsome circular giving complete details free for the asking.

**SMITH BROTHERS, General Sales Agents, Box M-A Auburn, N. Y.**

## ANNOUNCEMENT EXTRAORDINARY

**The Uni-Coil Ignition System for Ford Cars Operated by the Ford Fly Wheel Magneto or Battery at the Remarkably Low Price of**

**\$15.00 Complete**



Just consider what this means to you—an ignition system fully equal in workmanship to the best high tension magneto especially designed to operate on the Ford fly wheel magneto or battery current, which does away with your inaccessible timer and the impossible problem of perfectly adjusting four vibrating coils.

An elevating gear bracket carries our special device, which is a combination of timer, distributor, and synchronizer. It contains a circuit operating mechanism of extreme simplicity, which causes one pair of contacts to time or synchronize the magneto or battery current to a single coil unit from which it is delivered by means of the high tension distributor direct to the four spark plugs, in precisely the same manner as a magneto; in short, the most satisfactory, long lasting and best adapted system possible to secure for a Ford car.

We furnish the outfit complete; you do not have to drill a hole or even furnish a screw.

This is your opportunity to equip your car with a high grade, dependable ignition system made and guaranteed by a thoroughly reliable firm of long experience.

**DEALERS:** Our sales on this system are exceptionally large. If you want to get in on this "Melon," place your orders promptly.

**LIBERAL DISCOUNTS TO THE TRADE.**

**New York Coil Company, 338 Pearl St., New York, N. Y.**

WESTERN BRANCH, 1461 Michigan Ave., Chicago, Ill.

# QUALITY—STYLE—COMFORT

“Push-the-Button”—  
Start the Motor.

“Push-the-Button”—  
Shift the Gears.



*Do It  
Electrically!*

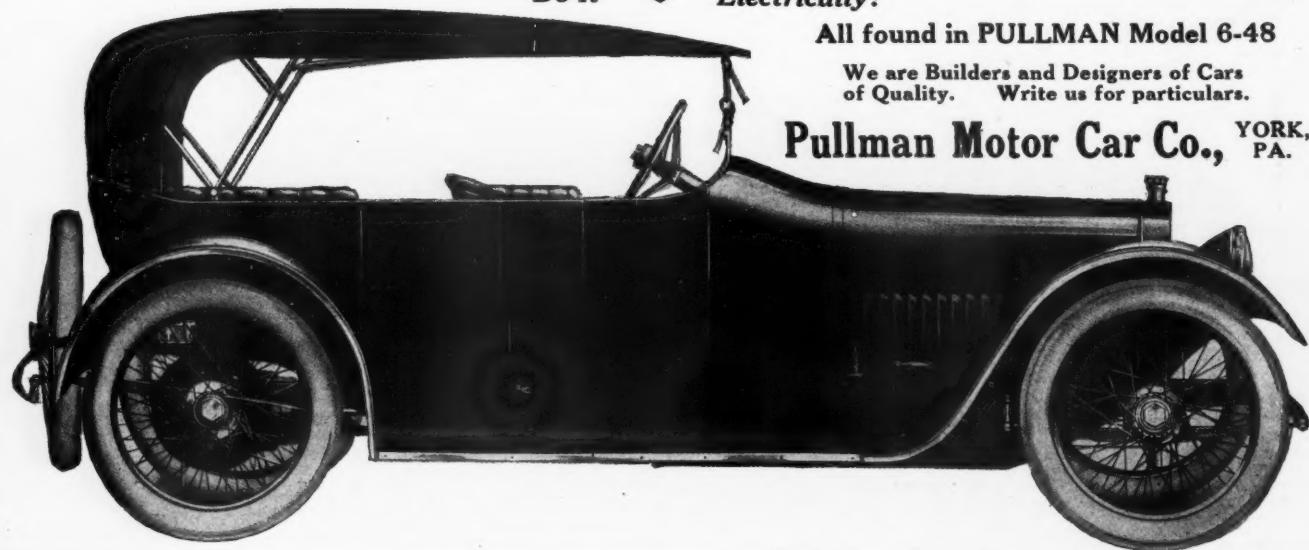
“Push-the-Button”—  
Sound the Alarm.

“Push-the-Button”—  
Light the Lights.

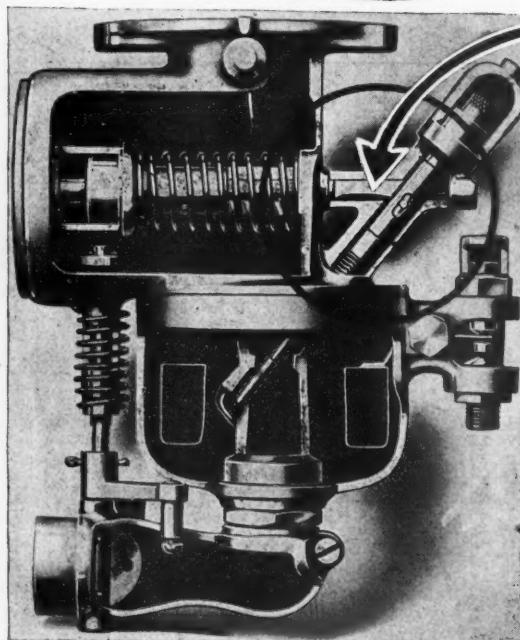
All found in PULLMAN Model 6-48

We are Builders and Designers of Cars  
of Quality. Write us for particulars.

Pullman Motor Car Co., YORK,  
PA.



## MUIR THE MADE TO ORDER CARBURETOR



*The  
“cut-to-order”  
cam*

The all-important and characteristic MUIR construction is this metric cam.

Here is the simple expression of a rather complex engineering effort.

A motor is placed on the dynamometer block and when the most efficient mixture of air and gas is determined for every load and speed, the efficiency curve thus plotted is transferred to this miniature nickel-steel cam. Then you have in crystallized form for all future time, the absolutely accurate proportion of air and gas which maintains perpetual efficiency.

THAT'S THE WAY THE MUIR CARBURETOR IS “CUT-TO-FIT” YOUR MOTOR.

This precise cam is made with extreme mathematical accuracy and is one of the crowning features of our many years of Carburetor experimentation.

Let us tell you more about this remarkable metric device.

**MUIR COMPANY, Inc.**

1216 Dime Savings Bank Bldg.,  
DETROIT, MICH.

324 Equitable Bldg.,  
BALTIMORE, MD.

# GABRIEL SNUBBERS

Lead All Shock-  
Preventing Devices



More

1914 CARS were factory-equipped with Gabriel Snubbers than any competing device. They are standard factory equipment on the easiest riding cars, such as White, Peerless, Stearns, Oldsmobile and Lozier; partial or special equipment on twenty other leaders.

More

1915 CARS will carry Gabriel Snubbers than any preceding year. EVERY manufacturer EVER using Snubber equipment has continued them for 1915; other world-famous cars have now adopted Snubbers for the first time.

More

LEADING automobile engineers and individual car owners than EVER BEFORE have turned to Snubbers this year, as the best equipment the market offers for MAKING CARS RIDE EASY AND LAST LONGER. Ask the Engineering department of YOUR car; we are willing to leave it to their judgment, as they have thoroughly tried out Snubbers and know their merits.

More

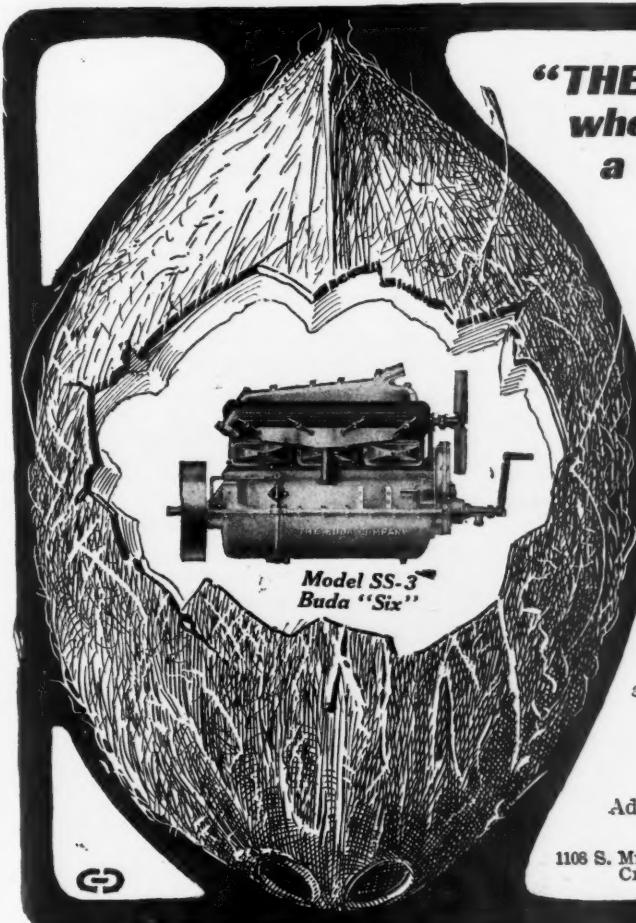
FOR YOUR MONEY is secured in Gabriel Snubbers at our quantity-manufacture prices of \$15, \$20, \$25, per set of four, two front and two rear; half that per pair.

**ONLY Leading Equipment is Worthy of Leading Cars**

WRITE US FOR FULL INFORMATION

**Gabriel Horn Manufacturing Company, 1415 East 40th St. Cleveland, Ohio**

We also manufacture the famous GABRIEL Musical Horns and Windshield Cleaners



**"THE MEAT IN THE COCOANUT,"**  
when you are paying good money for  
a car or truck, is the FACT that the

**BUDA**  
MOTOR

is "The Part That Sells the Car"

Do you realize that Automobile and Truck Manufacturers are giving up their Motor Departments in favor of the BUDA Motor, because they KNOW that a whole great Organization concentrating on one thing—THE MOTOR—can build BETTER Motors at a reasonable price than anybody's Department can build at any price?

Do a little exploring under the hood before you buy. If you find a BUDA Motor, you will know that no car you'll ever meet on the road (even a \$5,000 one) will have a better motor than yours. (Because "there aint no such animile.") Write us.

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FORD BUILDING  
DETROIT

# HERZ PLUG



The reasons for HERZ PLUG'S superiority to ordinary makes are definite and obvious. The insulation is DOUBLE STONE. The electrodes are PLATINUM-ALLOY. There are FOUR SPARKING POINTS. HERZ PLUG is SELF-CLEANING. It is GUARANTEED A FULL YEAR.

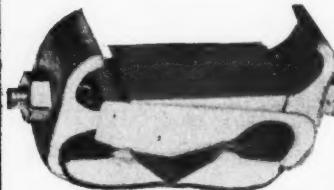
Price, \$1.50. Order from your dealer or HERZ & CO., 245 W. 55th St. (near B'way), New York

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CHESTER DEMOUNTABLE RIMS are made especially for Ford Cars so that Ford owners can equip their cars with over-size tires without changing or altering the regular standard Ford wheels. A set of five (one for spare)

## Chester Demountable Rims

complete with attachments, sells for \$25. These rims use 32x3 tires on all four wheels—over-size according to Ford tire equipment—therefore giving Ford cars more comfort and better tire mileage.



This is the most practical Ford improvement of the year. Write for catalog and dealers' discounts.

**CHESTER DEMOUNTABLE RIM CO.**  
FALL RIVER, MASS.

5-8

### "WARNER GEARS—STANDARD FOR YEARS"

"It's an absolute impossibility to 'open up' a plant and immediately deliver efficient gear assemblies.

"It takes time and experience—especially experience—to enable a concern to ship really dependable parts.

"This is an undisputable fact, no matter what the business happens to be.

"We are surely capable, in lieu of these facts, as for thirteen years we have been manufacturing automobile gear parts for the most successful and best known motor car manufacturers in the country.

"And listen, what is more, we've been pleasing them in every particular.

"Is there any better proof of a product's merit than one hundred per cent of satisfied customers?

"Looks as if we ought to be able to please you too."

# WARNER GEAR CO.

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DETROIT OFFICE—628 FORD BLDG.

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*Best for Every Purpose*

have all that beauty, all that quality, all that fine workmanship can bring to a glove, and three glove innovations besides—Rist-Fit Grip-Tite and Ventilated Back.

Rist-Fit gives Grinnell Gloves a snug fit at the wrist and prevents cuff from sagging down over the hand.

Grip-Tite, the corrugated double palm, gives the non-slip grip and sure control of the steering wheel—and double wear. Ventilated Back lets in cool air, yet keeps out dust. Grinnell Gloves are made of finest selected Reindeer and Coltskin—soft as velvet wear like iron. Washable in soap and water or gasoline—come out like new.

Style  
V-4020

**Morrison-Ricker  
Manufacturing Co.**  
(Established 1856)  
64 Broad St., Grinnell, Iowa



If your dealer doesn't carry them, send us his name and your size. We will send your selection on approval. Write for our illustrated glove booklet and samples of leather.

## More Than \$10,000,000

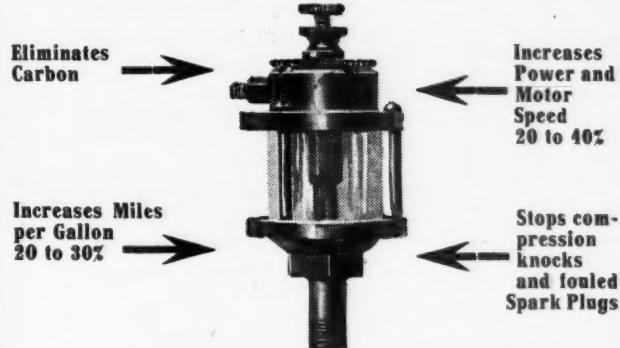
is spent each year to clean carbon from motors and repair damage done by it.

If every car were equipped with a

### HAWXHURST HYDRO-OXYGEN AUXILIARY CARBURETOR

a motor would not know what it is to be CHOKED TO DEATH by carbon.

#### 3 Devices Made in One



Models from \$6.00 to \$15.00

FIRST COST ONLY COST

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All Devices Guaranteed or Money Back

Exclusive Agents Wanted in Unoccupied Territory

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**"There's a mighty big difference in lubricators!"**

Don't blame your car for what it can't help. Many a car is inefficient only because its lubrication is bad. Try Badger Gear Compound just once and notice the difference.



## BADGER Gear Compound Is "Always on the Teeth"

It never runs thin and stays where you put it. Will not pack the sides of the gear case. Nothing like it for minimizing wear and quieting rear axles and transmissions. Every ounce lubricates. Learn more about this power-saving lubricant — also about the popular F. V. Motor Oil and Badger Lubricants. Ask your dealer or write us.

Dealers, Write Us

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## Make Your Ford Car Ride Easier

Add the pleasures and comforts of easy riding to the dependability of your Ford car. Don't let "car fatigue" caused by rough roads spoil a day's motoring enjoyment. Equip your Ford car with—

### BUCKEYE DE LUXE SHOCK ABSORBERS

They knock the shock—give perfect results on any road, under any load. Constructed of best materials obtainable, including drop forgings, Bronze Rocker plates and Bronze bushings. Unlike other shock absorbers, they never sway when taking sharp curves. However rough the road, the downward motion on their spiral springs is always at right angles. Can be attached in one hour by any Ford owner.

Price, per set of 4, \$15.00. Per set of 2, \$8.00. In ordering specify whether for Touring Car or Roadster.

Order through your dealer or send direct prepaid on receipt of remittance. Absolutely guaranteed.

Dealers and Jobbers Wanted Everywhere

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THE CENTRAL BRASS & FIXTURE CO., Springfield, Ohio



Takes the Jar Out of the Ford Car

## The Hollenden Cleveland

J. H. THOMPSON ---- MANAGER

### EUROPEAN PLAN 800 ROOMS

*The Leading Hotel  
of America's  
"Sixth City."*

*Home  
of the  
Cleveland  
Automobile  
Club.*





## Buyers to Share in Profits Lower Prices on Ford Cars

Effective from August 1, 1914, to August 1, 1915, and guaranteed against any reduction during that time:

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Runabout - - - 440

Town Car - - - 690

F. O. B. Detroit, all cars fully equipped.  
(In the United States of America only)

Further, we will be able to obtain the maximum efficiency in our factory production, and the minimum cost in our purchasing and sales departments, if we can reach an output of 300,000 cars between the above dates.

And should we reach this production, we agree to pay as the buyer's share from \$40 to \$60 per car (on or about August 1, 1915) to every retail buyer who purchases a new Ford car between August 1, 1914, and August 1, 1915.

For further particulars regarding these low prices and profit-sharing plan, see the nearest Ford Branch or Dealer.

FORD MOTOR COMPANY

# Twitchell Air Gauge

*The New Positive Lock Stop*



feature renders absolutely impossible the registration of any but the exact pressure in your tires.

## Don't Guess

Tires inflated to forty pounds look and feel exactly like tires containing eighty. The only way to tell the exact air pressure in your tires is by means of a TWITCHELL gauge.

Price One Dollar  
For Sale by Jobbers, Dealers and  
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is a feature of SPLITDORF BRANCH HOUSES. We have an exchange proposition of the greatest interest to every owner of a gasoline motor who would save time and money. You can exchange ANY MAKE of magneto or, in fact, any ignition system throughout with us—low tension, dual, self-contained high tension systems, and coils and transformers—and save real money with our up-to-the-minute equipment.

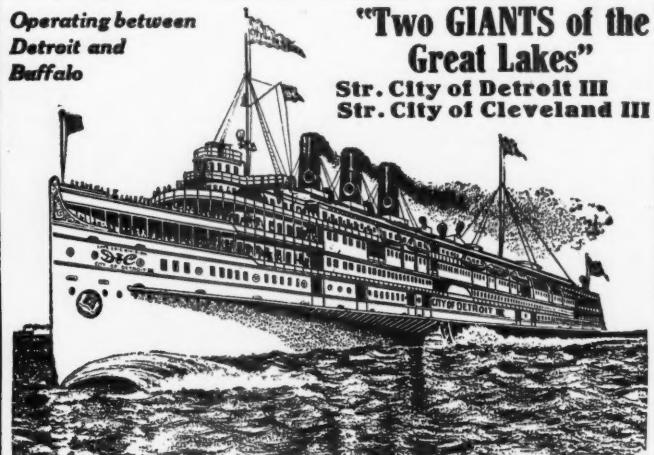
Write or Call for "Exchange Details"

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Str. City of Detroit III  
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REST after work is necessary to human endurance, and holidays are a wise economy. The Great Lakes of America offer more vacation opportunities than any other source in the country. The steamers of the Detroit and Cleveland Navigation Company operating to all important ports are unrivaled in point of elegance, comfort and quality of service—the perfect freedom offered by the saloon and promenade decks, the commodious state rooms, luxurious furnishings and excellence of cuisine make life aboard these floating palaces a solace to the weary mind and body.

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Daily service is operated between Detroit and Buffalo, Detroit and Cleveland; four trips weekly between Toledo, Detroit and Mackinac Island, the historic summer resort of the North Country; and from June 25 to Sept. 10 a special steamer, two trips weekly, will be in commission between Cleveland and Mackinac Island, stopping only at Detroit every trip. During July and August special daylight trips between Detroit and Cleveland. From June 10 to Sept. 10—daily service between Toledo and Put-In-Bay.

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Steamers arrive and depart from Third Avenue Wharf, Detroit.

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## Ammeters

for the  
Cowl  
or  
Dashboard

are specially built with a full knowledge of the exacting requirements of automobile service. They are designed for continuous reliability and like all other Weston Models, are constructed with the most conscientious regard for the service for which they are intended.

Their serviceability, accuracy, and durability is vastly superior to that of any other small instrument and, in fact, their merits are so radical as to place them in a class which is distinctly their own. We should be glad to prove these statements upon request.

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Chicago      St. Louis      Detroit      Richmond      London  
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**NO** Electrical Wiring  
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An absolutely efficient Motor Horn at a reasonable price — without expense of upkeep or operating.

**Automobile Supply Mfg. Co.** 220 TAAFFE PLACE  
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EQUIPMENT FOR EVERY ELECTRICAL NEED  
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*It Replaces the Spark Plug*



This device embodies a remarkable firing process by which the ignition current is transformed into an infinite number of high frequency sparks. The result is full power explosion strokes maintained in regular service instead of merely "smooth ignition."

Write for letters showing unequalled conservation of both power and fuel. Better still, fill out form below and we will send a set by parcel post insured for 20 days' trial on your own machine. As a bookkeeping facility you can send check or money order at \$2.00 for each Power Plug. This money will be refunded if you are not in every way satisfied.

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204 McCormick Building

Dayton, Ohio

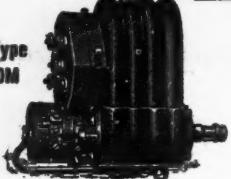
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Name .....  
City ..... State .....  
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throughout. Your magneto,  
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all guaranteed by one maker  
**THAT'S SERVICE**

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The performance of **HEINZE IGNITION APPARATUS** for the past ten years justifies our claim that our product is superior in both points of construction and efficiency.

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For  
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*"The Car of Instinctive Control"*

**DEALERS!** Do you realize the unusual opportunity that comes with representation of the highest class electric built? Some territory still open. Our 4-page advertisement in this paper June 25th tells more. Read it, then write.

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We have a money making proposition for every live dealer in the country. It will pay **YOU** to investigate it NOW.

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**SERVICE AGENTS**  
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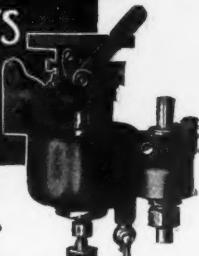
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NO MOVING PARTS  
ONLY ONE ADJUSTMENT

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THE Springs of a motor car have to do more than carry the weight of car and passengers. They have to take all the shocks of the road at any speed.

Insist upon Detroit Springs that are tested to the extreme possibility of emergency shocks under full load.

Detroit Springs are *guaranteed for two years.*

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*In Design 'Tis the Newest  
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**LARGE PRODUCTION IN DETROIT**

Now Every Motorist Can Have  
**A MASTER**  
QUICK ACTION

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# \$890

**Completely Equipped**

WAHL MOTOR COMPANY  
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**Guaranteed for 10,000 Miles**  
**Brixtson Pneumatic Tires**

We now sell Brixtson Pneumatic Tires on a specific guarantee of 10,000 miles service. *Brixtson Pneumatic Tires* are Puncture-proof, Blowout-proof, Skid-proof, Rim-cut-proof, Oil-proof and Gasoline-proof. A tire with wonderful resiliency and easy riding qualities.

Ten Days Free Trial—To remove any possible doubt concerning the merits of Brixtson Tires and to back up our statements fully, we will allow you ten days' trial on these tires at our risk. If Brixtson Tires are not perfectly satisfactory in every way you can return them to us at any time within ten days and we will cheerfully refund the entire purchase price. Send for particulars today.

Have Your present Tires Rebuilt the **BRICHTON WAY**—If you are not in need of new tires and the fabric in your tires is still good, we can rebuild them the Brixtson Way, give you thousands of miles additional service and make them Puncture-proof, Blowout-proof, Skid-proof, Rim-cut-proof, Oil-proof and Gasoline-proof.

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A 10,000 Mile Written Guarantee with every Brixtson Tire assures you of Tire Economy you have never known before

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ELECTRIC  
SOCIETY'S TOWN CAR

**Every Third Electric Built and Sold is a Detroit Electric**

**Prices**

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**Anderson Electric Car Company, Detroit, Michigan**  
Builders of the Detroit Electric  
World's Largest Manufacturers of Electric Pleasure Vehicles

**"THE TUGBOAT OF LAND COMMERCE"**

**SOLVES THE HEAVY TRUCKING PROBLEM**



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TRADE MARK REG. IN U. S. PAT. OFFICE  
TIRE PRESSURE GAUGE

MADE BY A. SCHRADER'S SON, INC., NEW YORK

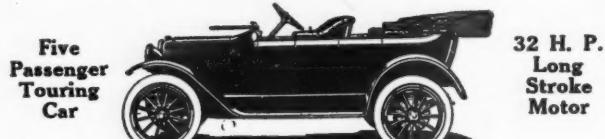
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### The Detroiter — A Complete Line \$850 to \$1050



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Long  
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Enclosed Valves. Three Point Suspension, Unit Power Plant, Platform Rear Springs, Full Floating Rear Axle, Left Hand Drive, Center Control, Drop Frame, Large Tires, Complete Ball Bearing Car.

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Electric Auto-Lite equipment for automobiles is as famous for the service that backs it as for the reliability and economy of its operation.

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High and low tension magnetos, make-and-break coils, dash coils, box coils, motorcycle coils, switches, spark plugs and other ignition specialties. Guaranteed satisfaction.

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"The Easiest Riding Car In The World"

**41**  
\$3250  
132" Wheelbase

# 48

  
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145" Wheelbase

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**gearless transmission**

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Big Model 5-A  
SIMPLE—STAUNCH—TRUE  
A Car Full of Hill Climbing Ability

Interesting Facts About the Gearless Transmission  
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Extra liberal wheel base, big wheels and tires, roomy tonneaus with luxurious upholstering—deep-pitched seats—powerful, flexible motor—full equipment. Write for beautifully illustrated catalog.

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ADJUSTABLE TO ANY LOAD

the shock absorbers that have made good on heavy and light cars alike. The adjustment feature found only on Coxajustos is the reason for their superiority. A simple twist of the wrist adjusts them to the load. There is a model especially for the Ford.

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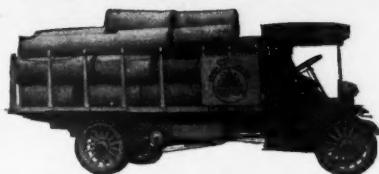
and you will also find out how to keep down tire repair bills with

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This wonderful tire accessory repairs cuts, punctures, slits, or blow-outs in casing or inner tube anywhere and leaves the vulcanized spot the strongest part of the tire. Send for this free book.

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are based on an experience of more than 14 years of successful motor truck building.

This combined with the best of material, the most careful manufacturing, has made it easy for them to meet the needs of hard service better than others, they are truly "built to be used."

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Department 9 Lima, Ohio, U.S.A.

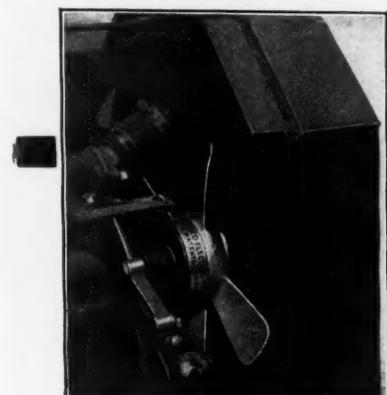
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For pleasure car, motor boat or truck.  
Porcelain and metal parts large and strong.  
Extremely simple construction

for cleaning — only four parts — shell, porcelain, bushing and gasket.  
With proper care GIANT Plugs can be used for years.

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**Kemco**  
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**DYNAMO-BATTERY LIGHTING OUTFIT**

Unsolicited testimonials from hundreds of owners are strong proofs of its efficiency and reliability.  
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**Lubrication IS an important question**  
That is why

**NON-FLUID OIL**

TRADE MARK  
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has been the unvarying choice of thousands of motorists for the past fifteen years. This effective lubricant has proven through its ability to cling to gear teeth and adhere to bearing surfaces, that perfect lubrication can be secured. The fact that the majority of motor car manufacturers recommend NON-FLUID OIL further proves its superiority.

"K. No. 000 Grade" for compression cups and all bearings.  
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Send for free sample, or ask your dealer for the orange colored can bearing sprocket-wheel trade mark.

**New York & New Jersey Lubricant Co.**  
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All the Facts on  
All lighting systems  
mailed you on request

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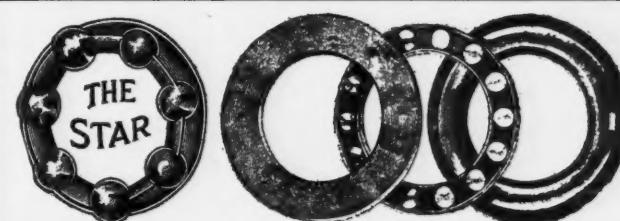


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6-60 Sparking Battery.....	5	7 1/4	9 1/2	\$7.49
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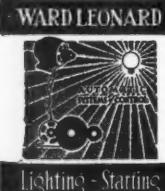
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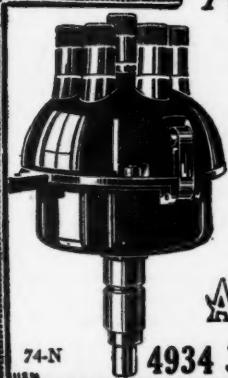
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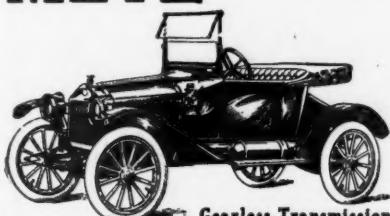
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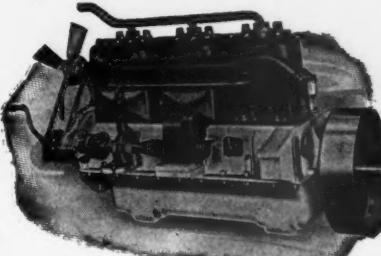
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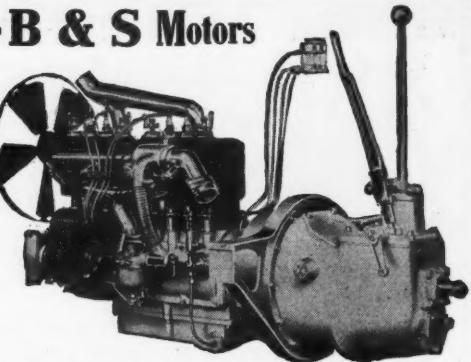
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# Motors G-B & S Motors

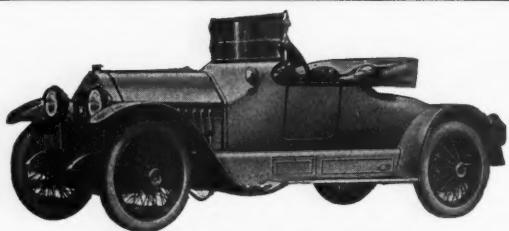
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Continental 6 P motor, 48 H. P. Bosch Ignition. Brown-Lipe 4 speed forward transmission. Spicer Universal joints. Timken full floating rear axle. Timken front axle with Empico speedometer drive. Timken bearings throughout. Long radiator. One man top. Gemmer steering gear. Left drive, center control. Goodyear tires, 8x4½. Electric starting, generating and lighting. 130-inch wheelbase. 3,600 lbs.

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**Ford Honeycomb Radiators**

This radiator will properly cool any Ford motor and make your Ford a better car. Get our dealers' proposition. Price, \$25.00 f. o. b. Detroit.

**DETROIT RADIATOR & SPECIALTY CO.,**  
 965 Woodward Ave., Detroit

### FORD OWNERS

Equip your cars with Seat Covers. Our direct to car-owners plan will save you money. Ten thousand satisfied customers last year.

**GLOBE SEAT COVER CO.**  
 Dept. M., RACINE, WIS.

**Ford Owners—Purdy Exhaust Horn**  
 for Fords is being used everywhere—positively will not clog or choke. Write today for catalogue. DEALERS, ask for prices.  
 Purdy Bros. Co., 49 E. 55th St., Chicago

**FORD OWNERS**  
 We can make your car the easiest rider made with light or heavy load; no jolt, no jars, no upthrew. Write us.

**Automobile Machine Co., Canisteo, N. Y.**

### FORD OWNERS AND DEALERS

The TOWNSAN AUXILIARY FRONT RADIUS ROD corresponds with the factory parts. You will like it when you see it. \$4.00 special price to dealers and jobbers.

**TOWNSAN AUTO SPECIALTY CO.**  
 Mitchell, S. D.

### FORE DOOR BODIES

1914 Models, five-passenger, fully upholstered; fit most any car. Cost, \$350.00; our price, while they last, \$85.00. Write for full description.

**THE M. & M. COMPANY**  
 480-500 Prospect Ave., Cleveland, Ohio

### FORE-DOORS AT CUT PRICES

**Mr. Auto Owner and Dealer:**  
 If you are driving an old style car, write for our bargain prices on Fore-Doors. Be up-to-date. All orders shipped promptly and doors guaranteed to fit.

Dept. "F"

**E. W. SHOWALTER & CO.**  
 315 N. Penna St., Indianapolis

### FOR SALE AT A BARGAIN

One Shaler Steam Vulcanizing Plant for garage use. Also small quantity of repair stock.

Address Box 135, Osceola, Wis.

**FOR SALE AT A BARGAIN**  
 New 5x6 four-cylinder, governor controlled engine, fully equipped with carburetor, magneto. Will sell for much less than cost. **FRED HANSON**, 570 Prior Ave., St. Paul, Minn.

### FOR SALE

A small number of modern, well designed and constructed six, five and four-passenger touring bodies and comfortable roadsters painted and trimmed. Will change and guarantee to fit your car. Write us.

**IRVIN ROBBINS & CO.**  
 Industrial Building, Tenth and Canal  
 Indianapolis, Ind.

### Guaranteed Radiators

Not always necessary to buy new radiators. New cores can be furnished for frozen or damaged radiators. We build the fin and tube type. Guaranteed copper fins and tube.

We also repair and furnish new cores for Maya radiators.

We build new cores for all makes and for all cars. Get our prices. You will save money.

Cores in stock for many standard radiators such as Hupps, Warrens, Herreshoffs, Buicks, E. M. F. 30, Studebaker, Hudson 20, Cadillacs and several others.

We can build and fit a new core in your radiator in two days—if in stock, in one day

Write for bargain sheet of accessories.

**HURON RADIATOR & LAMP CO.**  
 253-255 Jefferson Ave., Detroit, Mich.

Terms: Cash with the order.

### JOBBERS AND GARAGES

Get our proposition on fibre gears for all makes of speedometers. We make anything you want from fibre.

**OGDEN FIBRE GEAR & TIRE CO.**  
 Columbus, Ind.

### Maxwell Owners and Repairmen

Why pay 20 per cent advance for your parts? We can supply 75 per cent of your wants at the old Maxwell-Briscoe list. Stoddard-Dayton transmission and equalizing gear parts at old list. Why pay more?

SEND FOR PRICE LIST

**M. P. SUPPLY COMPANY**  
 Atlanta, Ga.

### Original Repair Parts Factory

We furnish repair parts for over 53 models of cars. Own original patterns, tools, etc., including Warren, Elmore, Marquette, Rainier, Welch-Pontiac, Welch-Detroit, F. A. L., Reliable-Dayton, Barnes, De Luxe, Demot, also Michigan, Cutting and many others. Everything for every auto.

**Puritan Machine Company**  
 Detroit, Mich.

**OBEY THE LAW—Have your license on your person in a nickel-plated tube, hitched to your key ring, ready for the traffic cop, 25 cts. by mail, send for story and picture. S. & B. MFG. Co., 15 Delaware St., Worcester, Mass.**

### Paint Your Car Yourself

Save \$25 to \$75 by doing the work at home with the Arsenal system. Our big free booklet, "The Car Beautiful," tells how. Send for it today.

**Arsenal Varnish Company**  
 Auto Dept., Rock Island, Ill.

### Peerless Cylinder Enamel

Saves your engine and metal rods from rust. Makes a smooth finish that is not affected by heat, gasoline or grease. Black or gray, as desired. Buy it from your garage, dealer, jobber.

The Columbus Varnish Co., Columbus, O.

### RECTIFIERS

To change from A-C circuit 1 to 8 ignition, lighting or starting batteries at one time; \$12 and upwards. **AMERICAN BATTERY CO.**, 1124 Fulton St., Chicago.

**Stop Polishing Your Nickel and Brass**  
 No Rub Polish brightens without rubbing. 50c per can prepaid. Sample to dealers.

**METAL FINISH CO.**  
 575 W. Main, Decatur, Ill.

### Liquidator's Sale

**Complete Marquette Auto Plant**

#### Extraordinary Price Inducements

I have been authorized to dispose of the entire lot of automobile parts, supplies, accessories, tools, bodies and everything for the automobile, including parts to build a complete car. This is the biggest lot of parts ever offered at direct sale.

Spark Plugs	\$ 19
End Wrenches	.15
Magneto Boots	.50
Dash Air Pumps	.79
Starting Crank Boots	.30
Gasoline Strainers	.50
Tail Lamps, Oli.	1.50
Tail Lamps, Electric	1.75
Side Lamps, Oli.	1.50
Side Lamps, Combination	1.75
Gas Head Lamps, per pair	6.25
Electric Head Lamps, pair	7.50
Pressed Steel Frames	5.00
Steering Gears, "Gemmer"	12.19
Steering Gears, "Jacox"	8.19
Weston Mott Rear Axles	40.00
Sliding Gear Transmissions	45.00
4 speed sliding gear transmissions with multiple disc clutch	50.00
Front door roadster bodies—in rough	20.00
Front door roadster bodies—painted and upholstered	55.00
Touring car bodies—painted and upholstered	65.00
Model H High Tension K.W. Magnets	18.50
Hartford Shock Absorbers—set	20.00
E. Z. Rider Shock Absorbers for Ford Roadster and Touring Cars—set	15.00
40 H. P. Motors	125.00
Exide Batteries	5.50
Wheels, all sizes	3.00
Front Axles	10.00
Electric Horns	2.49
Carburetors—Rayfield, Schebler, Kingston and Fletcher	5.19
Windshields	9.00
Stromberg Carburetors	8.19
1" Buffalo Carburetors	3.00
Oval Gasoline Tanks—11x22x29	3.00
Straight High Tension Volta Magnets	15.00
4 Cyl. Remy Magnets with coil	20.00
Ford Lighting Outfit	2.25
Ford Lighting Generators	26.00
Ford Wheel Pullers	.30
Rayfield Carburetors with Manifold for Ford Model "T"	8.20
Ford Oil Gauges	.30
Ford Spark Plugs	.18
4 Cyl. Remy Coils	6.00
Splitdorf Coils	6.00
Standard Speedometers for 36x4 wheels	7.00
Stewart Speedometer Heads	3.95
Tool Boxes—18x8x8	1.25
Tool Boxes—24x9x8 1/2	1.50
Electric Side Lamps—for cycle cars	1.00
Brake Lining, per foot	.25
Tire Repair Kits	.35
Front and Rear License Brackets	.35
Steering Wheels	1.00
Tire Covers—any size	.75
3/4 and 5/8 Brake Rods with clevis	.35
Mufflers, 1 1/4 opening	1.50
Foster Shock Absorbers, set	6.00
Rear Axles with unit transmissions	80.00
Assorted spring clips, per doz.	1.00
100 Assorted Cap Screws	.50
100 Assorted Nuts	.50
100 Assorted Rivets	.20
100 Assorted Washers	.35
Erie Pipe Wrenches	.25
Watch dog locking devices	.75
Warner Autometers—complete	9.50
Rumble Seats	3.50
Tool Boxes	1.25
Robe and Foot Rests	.35
Auto Jacks	1.00
Tire Pumps	1.50
Metal Polish—1/2 and 1 gal. cans, per gallon	.50
Auto Soap, 5 and 10 lb. cans, per pound	.10
Tool Kits	1.09
Tire Chains, many sizes, for	3.09
Bulb Horns—complete	.75
Vulcanizers	.79
Stewart Gas Savers	3.50
Radiators for many cars	20.00
Springs—many sizes	3.00

**Almost Everything at a Special Low Price—Send for Big Catalogs**

### Alfred O. Dunk Liquidator

412 Lafayette Boulevard  
 Detroit, Michigan

This is my fifty-third sale. I have closed out that many factories.

# The Clearing House—continued

## PARTS FOR ALL CARS

100 Assorted Cap Screws.....	.50
100 Assorted Nuts.....	.50
100 Assorted Rivets.....	.20
100 Assorted Washers.....	.35
Brake Rods with clevis pins % and %.....	.35
Automobile Springs for many cars.....	3.00
Oakland Radiators.....	20.00
Radiators for many other cars.....	25.00
Roadster Bodies—Painted and Upholstered	55.00
Touring Car Bodies—finished.....	75.00
Front and Rear Fenders, each.....	3.00
Weston Mott Rear Axles.....	20.00
Front Axles.....	10.00
Wheels—all sizes.....	3.00
Square Gasoline Tanks.....	1.00
Round Gasoline Tanks, 12x29.....	2.75
Tool Boxes with two locks, 29x12x9.....	1.50
Hupp Touring Car Tops, Model D.....	12.00
Kingston Carburetors, 1 1/4" top intake.....	3.95
Fletcher Carburetors, 1 1/4" top intake.....	3.95
Mondex Shock Absorbers, set of four.....	15.00
Motor Driven Electric Horns.....	7.50
Vibrator Horns.....	2.49
Tire Covers, many sizes.....	.75
Standard Speedometers.....	7.00
Sparke Plugs, all sizes.....	.19
Lunkenheimer Regulators.....	1.00
Complete Tool Kits.....	1.00
15" Straps.....	.05
Motor Fans.....	3.00
15" Steering Wheels, 1/2" hole.....	1.00
Clear Vision Windshields.....	7.90
Tire Chains, 36x4 1/2, 25x4 1/2.....	3.00
Tire Chains, 28x3, 30x3.....	2.50

**PURITAN MACHINE CO.,**  
Detroit, Mich.

ALL PARTS

ALL CARS

## Peerless Jet Black Fender Japan

Fenders finished in a rich, black, heavy bodied japan. Air dries in thirty-six hours. One coat covers solid. Buy it from your garage, dealer, jobber.

**The Columbus Varnish Co., Columbus, O.**

## Radiators

Our Genuine Cellular (commonly called Honeycomb) radiators will properly cool your motor. Each radiator carries with it "a money-back-if-you-want-it-guarantee."

Ford "T",	\$25.00
Buick 10-24-25-34-35-36	27.50
Buick 16-17-18-26-27-28	35.00
Buick 21-38-39-43	37.50
Cutting 35.....	22.00
Hupp 20.....	25.00

5% discount allowed for cash with order.  
All orders shipped same day as received.

**DETROIT RADIATOR & SPECIALTY CO.,**  
963 Woodward Ave. Detroit

## Peerless Mirroroid

Like varnish. It dries with a rich gloss finish. Apply with a cloth to old varnished surfaces. Leaves a durable finish that will dry in four to five hours. Buy it from your garage, dealer, jobber.

**The Columbus Varnish Co., Columbus, O.**

## TOOL KITS

Special Sale of Complete Tool Kits  
Why pay \$5.00 when you can get a standard kit complete for \$1.09?

**PURITAN MACHINE CO.**  
Detroit, Mich.

ALL PARTS

ALL CARS

## SAFETY RADIUS RODS FOR FORDS

Safety Radius Rod and Front Axle Support only device bracing axle direct to frame. Prevents broken and bent radius rods. Takes all strain from crank case. Makes car steer better. Every Ford owner needs one.

**BERNARD MONNICH**

Hooper, Nebr.

## SPEEDOMETER REPAIR CO.

We repair any broken Flexible Shaft Casing or Housing, Swivel Joints and all Speedometer Parts. Fibre Pinions all sizes, 50c and 75c. All goods shipped same day received.

1331 W. Jackson Blvd., Chicago

## Tops Built, Recovered and Repaired

Also top covers, radiator covers, luggage cases, celluloid, etc.

**C. G. MEYER & SON, Tiffin, Ohio**

## We Make Ford Racing Type Bodies

In several models for immediate delivery

**AUTO SHEET METAL WORKS**

1532 Michigan Ave. Chicago, Ill.

**YOU CAN CHANGE YOUR CAR**  
into raceabout yourself. We furnish radiators, hoods, seats, tanks and fenders. Get our prices.

**AUTO SHEET METAL WORKS,**  
1532 S. Michigan Ave. Chicago, Ill.

**WE MAKE FORD RACING TYPE BODIES**

In several models for immediate delivery

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In several models for immediate delivery

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# The Clearing House - continued

## WELDING PLANTS

No. 1—Without tanks.....	\$36.00
No. 2—With acetylene tank.....	52.00
No. 3—With carbon burner.....	57.00
No. 4—With 200 ft. oxygen gas.....	61.00

### TERMS

No. 1—Cash with order.....	16.00
No. 2—Cash with order.....	32.00
No. 3—Cash with order.....	37.00
No. 4—Cash with order.....	41.00
Balance \$5.00 per month, contract, or for all cash deduct 5 per cent. Address Dept. R.	

**AUTO WELDING AND MFG. CO.**  
Omaha, Neb.

**10,000 Miles Without Punctures**  
10,000 miles without punctures or slow leaks and doubled mileage. Porous tubes repaired in five minutes with "SIN-TI" Puncture Fluid, the practical puncture eliminator. All at small cost of 50c per 3 or 3 1/4 inch tube, 75c per 4 or 4 1/4, \$1 per 5 or 5 1/4. Satisfaction or money back. Literature upon request.

**SIN-TI TIRE CO.** Washington, D. C.

**\$100 is the Cost of the Acme Cylinder**  
Grinder, an attachment for a lathe that will grind automobile cylinders round and straight. Particulars on request.

**ACME GRINDER CO.**  
2740 Humboldt Ave., So., Minneapolis, Minn.

50 cents keeps your car bright for a whole season. By using That Mysterious Rag Duster. Can't be beat. Polishes auto bodies, lamps, windshields, etc. Satisfaction guaranteed or money refunded. **GEM SUPPLY CO.**, 1036 S. Main St., Waterbury, Conn.

## PATENTS & PATENT ATTORNEYS

**C. L. Parker, Patent Attorney**  
Formerly member Examining Corps, U. S. Patent Office, 960 G St., Washington, D. C. Pamphlet of instruction sent upon request.

**PATENTS SECURED EVERYWHERE**  
My aim is to honestly advise and faithfully serve my clients. Incorporation papers prepared.

**F. V. WINTERS, Patent Lawyer,**  
125 East 23rd St., New York City

**PROTECT YOUR IDEAS**  
Send for free book and free search plan.  
**MILO B. STEVENS & CO.**  
53 W. Jackson Blvd., Chicago  
Established 1864 Main office, Washington

## PORTABLE GARAGES

**PRIVATE GARAGES**  
Galvanized steel or wooden. The finest line offered. If interested, write.  
**Garage Factory, Beaver Springs, Pa.**

## RADIATOR AND LAMP REPAIRING

**A. A. A. Radiators Manufactured**  
Any make repaired and returned same day. Radiator to fit any car shipped in 3 days.  
**SHEPFORD CO.**, 1331 Jackson Blvd., Chicago

**ALL KINDS OF AUTO RADIATORS, HOODS,**  
fenders, lamps, windshields, etc., rebuilt and repaired. All work guaranteed. Phone or mail order. Telephone Calumet 4583.  
**L. BLUMENFELD & CO.**  
1919 Wabash Ave., Chicago

**AMERICAN AUTO SHEET METAL WORKS**  
We are masters of the trade. Manufacturers of Radiators, Hoods, Fenders, Gas Tanks, etc. Repairing a specialty.  
1446 Wabash Ave., Chicago, Ill.

**ARROW RADIATOR REPAIR CO.**  
1331 Wabash Ave., Chicago, Ill.  
Expert repair work on Radiators, Hoods, Fenders, Dashes, Tanks and Drip Pans. We guarantee all our work. Phone Calumet 1995.

Before ordering elsewhere, get our prices on new radiators, horns, fenders, tanks and for installing new cores in old or damaged radiators. Radiator repairing our specialty.  
**ILLINOIS AUTO SHEET METAL WORKS,**  
58 E. 16th St., Chicago, Ill.

## CHICAGO MFG. CO.

1466 Michigan Avenue, Chicago  
We are the only radiator manufacturers in Chicago making a square tube radiator. New guaranteed cores placed in old radiators. We also manufacture Hoods, Fenders, Tanks and Pans and do guaranteed repair work. Prompt service.

**M. & L. Auto Sheet Metal Works**  
Rebuild and repair radiators, hoods, fenders, tanks, lamps, etc. Tel. Calumet 2348.  
1551 Michigan Ave., Chicago, Ill.

## ONLY RADIATOR FACTORY IN NORTHWEST

Pioneer manufacturer. Why send your radiator down east when you can ship it to us; save time, express, freight, money, and get best workmanship. Prices right. Make new radiators; allow for old one.

**TODD MANUFACTURING CO.**  
820-824 Mary Pl., Minneapolis, Minn.

## REBUILDING AND REPAIRING

### A NEW MOTOR

made out of your old one; we will reboore and grind your cylinders and make new pistons and new rings, the whole operation to be up-to-date factory methods; write or 'phone for prices on your car.

**STARBUCK AUTOMOBILE CO.**  
Baltimore Ave. and Fernwood, Reborning Dept., Philadelphia, Pa.

**All Kinds of Automobile, Marine and Aviation Engines Overhauled and Rebuilt**

I still have room and equipment to turn YOUR job out PROMPTLY. My prices are reasonable. Light Weight Racing Type Pistons and Connecting Rods of MAGNALIUM are my specialty.

All work done by first class workmen on accurate and efficient machinery. Let me figure with you.

**LEE W. OLDFIELD**  
526-530 So. Fifth St., Minneapolis, Minn.

### ANDRE G. CATELAIN

General machine work for foreign and American cars. Welding of all kinds of metal. Eveready Automatic Engine Starter Sales and Service.

Carbon removed with oxygen

Manufacturer Catelain Hose Coupling

1446-8 Indiana Avenue Chicago

### AUTO SPRINGS REPAIR CO.

We manufacture and repair springs. Proper action compound put in springs.

1331 Jackson Boulevard, Chicago, Ill.

### CYLINDER REBORED

Including piston and rings.....\$7 to \$11

**STERLING ENGINE CO.**

331 So. Clinton Street Chicago, Ill.

### FORD Cylinder Grinding New Pistons, Rings, Pins

Our special equipment for grinding Ford Model T cylinders enables us to fit new pistons, new rings, and piston pins on short notice. A complete job better than new at prices that will interest Ford dealers as well as owners.

Write at once to

**AUTO ENGINE WORKS**  
St. Paul, Minn.

## CYLINDERS REBORED AND REGROUND

### Fitted With My Light Cast Iron Pistons

40% to 100% lighter than standard, and with my new rings, makes a four run like a six, with a guaranteed gain in efficiency of from 25% to 50%

**McCADDEN MACHINE WORKS**  
ST. CLOUD, MINN.

## CYLINDERS REGROUND

and fitted with new pistons and rings for \$7 to \$11 per cylinder. We do this class of work exclusively and are thus able to give you the highest class of work at these prices.

Oxy-acetylene welding done at reasonable prices

### CROWN MACHINE SHOP

Crown Point, Ind.

**REGRINDING CYLINDERS, FITTING NEW PISTONS AND RINGS** — our specialty. Our experience and special equipment enables us to do high grade work at lowest prices. Send bore and stroke for quotation. **SEBELIN TOOL WORKS**, Davenport, Ia.

### STOP THAT KNOCK LET US EQUIP YOUR ENGINE WITH OVERSIZE

Hardened and Ground Wrist Pins  
Cylinder Grinding Crank Shafts Straightened  
**ADAPT MACHINERY CO.**  
1624 So. Wabash Ave. Chicago, Ill.

We repair Auto Radiators, Lamps, Fenders, Windshields, Tanks and Horns of all kinds. Bargains always on hand. Estimates given.  
**HUDSON AUTO LAMP WORKS, INC.**  
1648-50 Broadway, New York City

## TIRES

## A 1 GUARANTEED TIRES

What make do you use? What size?  
WRITE FOR OUR PRICE BULLETIN  
We pay express charges.

**ALLEN S. SINSHEIMER**  
1503 Michigan Ave. Chicago, Ill.

### Auto Tires Recovered as Follows

30 x 3	.....	\$5.80	32 x 3 1/2	.....	\$7.80
30 x 3 1/2	.....	7.20	34 x 4	.....	9.65
36 x 4 1/2	.....	12.00			

Non-Skid Treads applied from \$1.00 to \$3.00 extra. Workmanship and material guaranteed. A trial will convince. Repairing tires since 1896.

**JUNGKIND & VOGLER**  
158 Chambers Street, N. Y. City  
Branch 1100 Bedford Avenue, Brooklyn, N. Y.

### TIRE REDUCTIONS!!

These tires are all of heavy car type of a well known manufacture. They are slightly blemished and average 5,000 miles service. 30x3, \$6.75; 30x3 1/2, \$8.50; 32x3 1/2, \$8.60; 33x4, \$12.40; 34x4, \$12.50; 36x4, \$13.75. All other sizes. Non-skids 10 per cent higher.

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### Tires! New Fresh Stock

Any Size What Brand Do You Want?

28x3	.....	\$ 6.90	30x4	.....	\$13.00
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30x3 1/2	.....	10.10	34x4 1/2	.....	17.60
34x3 1/2	.....	10.50	36x4 1/2	.....	20.10
36x3 1/2	.....	11.00	36x5	.....	23.00

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In Guaranteed, Seconds and Used Tires  
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ONLY REAL HUSTLERS. We have the best automobile tire proposition. \$1.00 to \$5.00 profit on every sale. No stock investment. 2c. stamp for particulars.  
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Write **RANDOLPH & CO.**,  
Patent Solicitors  
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Autogenous welding of all metals, such as crank cases, cylinders, etc. We positively guarantee all work. Tel. Calumet 3563.

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For Fords and Other Small Cars

**BIG VALUE FOR LITTLE MONEY**

This little pump is made of grey iron bored and reamed. Can't get out of order. Won't overheat and stick in the cylinder. Always works. Pumps pure cool air. Saves your time, temper and tires. Wears forever. Nothing like it at anywhere near the price. Find out all about it. Your dealer or your neighbor knows; if not, ask us.

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**\$2400**  
Completely Equipped

More Power  
More Flexibility  
More Economy  
More Silence

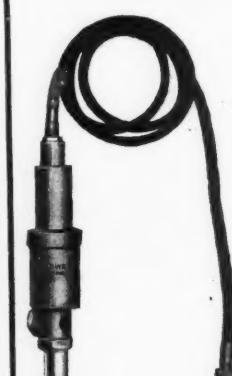
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Four-cylinder,  
five-passenger,  
50 horsepower,  
128-in. wheelbase.

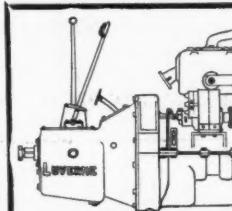
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POWER PLANTS**

with  
Electric Starter

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**ONE 1913 REO RUNABOUT FOR SALE**, newly painted and in first-class repair. Price \$685. C. H. Brewster, 147 Washington St., Middletown, Conn.

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**WILL TAKE LATE MODEL LIGHT TOURING** car up to \$500, balance cash for equity in a beautiful modern bungalow on good street, near car, church and schools. Owner, 665 Cameron Ave., Detroit, Mich.

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Makers of

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Illinois All goods shipped same day ordered. Give us a trial order and be convinced.

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Write for Estimates

CLEVELAND, OHIO

**WANTED**—AN ASSISTANT ENGINEER BY an automobile manufacturing company in Indiana. Wish man who has held similar position in one of the larger automobile factories. Address Box E-179, c/o Motor Age.

**WANTED**—FIRST-CLASS REPAIRMAN capable of taking full charge of the repair department. Permanent place to right man. State experience and references in first letter. E. J. Miles & Co., Newton, Iowa.

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**EXPERT REPAIR MAN WANTS POSITION** as garage manager or similar position where automobile experience and knowledge is necessary. Technical graduate, nine years' experience, married and strictly sober. Can furnish best of references. West or Northwest preferred, but not particular. Only position with first-class establishment considered. Address Box E 172, care Motor Age.

**POSITION WANTED BY YOUNG MAN** with some experience in garage as helper. Will make good if given a show. John Stafford, R. F. D. 6, Memphis, Mo.

**REPAIRMAN**—10 YEARS' EXPERIENCE, 4 years as foreman, wishes position; knows the repair business and can handle men; also expert with electric systems. Only solid firms answer; married, sober. Address Box E-184, c/o Motor Age.

**WANTED**—POSITION BY FIRST-CLASS, all-round machinist, blacksmith, engineer and auto repair man; 25 years' experience; at present employed. Write for particulars. Box E-175, c/o Motor Age.

**WANTED**—POSITION, WORKING GARAGE foreman; eighteen years' experience. The man to build up garage. Temperate; don't use tobacco. Address Box E-185, care Motor Age.

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**FOR SALE**—EXCEPTIONALLY PROFITABLE and finely equipped garage, general repair and paint shop, in Michigan city of 6,000 population. Desirable lease of modern brick building 38x140—2 story and basement. Must be sold quickly account of poor health. Address Box E 169, care Motor Age.

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## THE AUTOMOBILE CATECHISM

The book for every motorist

Now on sale for \$1.25

Regular price \$2.50

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THE CLASS JOURNAL CO.  
910 S. Michigan Avenue, Chicago

(42)

Dealers, send for our 1914 catalogue and 1915 advance supplement, just out. New goods, and reduced prices.

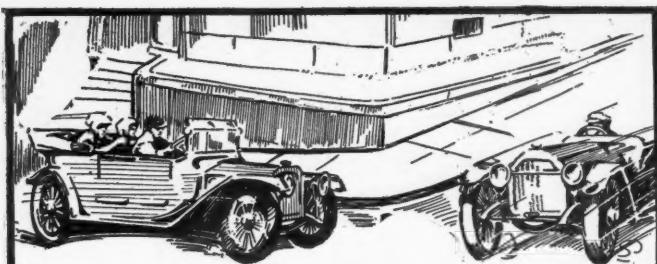
Illinois All goods shipped same day ordered. Give us a trial order and be convinced.

## The PARISH & BINGHAM COMPANY

### PRESSED STEEL FRAMES

Write for Estimates

CLEVELAND, OHIO



## Elektra Brake Lining Insures Safety of Driver and Car

A good brake lining is one of the very important "little things" that often determine between safety and accident. If it slips in an emergency it may be responsible for sending your car to the scrap-heap; if not you to the hospital.

In a threatened collision "a miss of an inch is worth more than insurance policies." Play safe! For that feeling of absolute "brake confidence" specify—

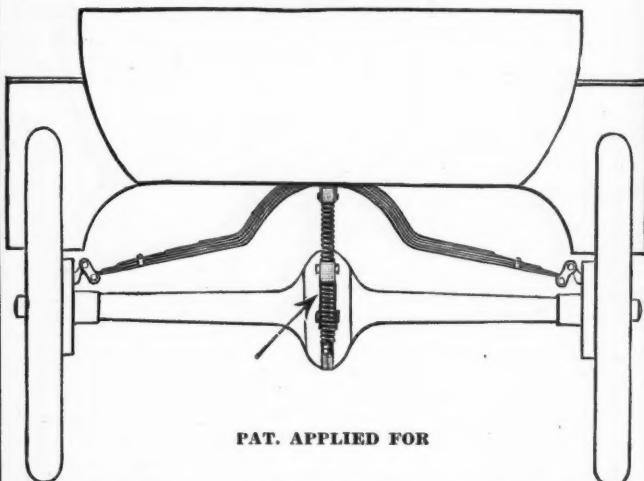
### Elektra Asbestos Friction Brake Lining

Made of selected asbestos, chemically combined (by a patented process) with an indestructible metal, and offering a very high coefficient of friction. That is why it will not burn, char, or slip; why oil, water, or vapor have no effect upon it.

In point of wear and service, it has no superior. Write for sample and complete information.

**The F. L. Horton Mfg. Company**  
Whittier Street, BOSTON, MASS.

### EMPRESS SHOCK ABSORBER FOR FORD CARS



This device checks the ordinary road shocks and regulates the rebound action of the springs.

It also steadies the car body, largely eliminating side sway.

Can be attached in ten minutes. No jacking up of car necessary.

The Absorber is carefully made from the best materials and nicely finished in black hard rubber finish.

Price \$5.00 Each

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Auburn, N. Y. ADDRESS DEPT. B.

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# Index to the

## A

Allen Auto Specialty Co. ....	99	Eisemann Magneto Co. ....	89
Anderson Electric Car Co. ....	85	Electric Auto-Lite Co. ....	86
Automatic Appliance Co. ....	1		
Atwater-Kent Mfg. Works ....	89		
Automobile Supply Mfg. Co. ....	83		

## E

Fedders Mfg. Co. ....	89
Firestone Tire & Rubber Co. ....	69

## B

Benham Mfg. Co. ....	89
Billings & Spencer Co. ....	99
Bosch Magneto Co. ....	84

Fulton Co. ....	89
-----------------	----

Bowen Mfg. Co. ....	98
Braender Rubber & Tire Co. ....	88
Bresler-Wallace Sales Co. ....	88

## G

Brierton Mfg. Co. ....	85
Bridgeport Brass Co. ....	88
Briggs-Detroiter Co. ....	86
Brown Co. ....	96
Buda Co. ....	79

Gabriel Horn Mfg. Co. ....	79
Garford Mfg. Co. ....	61
General Motors Truck Co. ....	56
Golden, Belknap & Swartz Co. ....	89

## C

Cartercar Co. ....	86
--------------------	----

Central Brass & Fixture Co. ....	81
----------------------------------	----

Century Electric Car Co. ....	84
-------------------------------	----

Century Foundry Co. ....	74
--------------------------	----

Chester Demountable Rim Co. ....	80
----------------------------------	----

Chicago Automobile Supply House ....	97
--------------------------------------	----

Classified ....	97
-----------------	----

Clearing House ....	91 to 96
---------------------	----------

Connecticut Telephone & Electric Co. ....	66
---	----

Continental Motor Mfg. Co. ....	45
---------------------------------	----

Coreoran Lamp Co. ....	84
------------------------	----

Covert Motor Vehicle Co. ....	64
-------------------------------	----

Cox Brass Mfg. Works ....	86
---------------------------	----

Cullman Wheel Co. ....	97
------------------------	----

## H

Halliwell Co. ....	81
--------------------	----

Heinze Electric Co. ....	84
--------------------------	----

Herz & Co. ....	80
-----------------	----

Hess Bright Mfg. Co. ....	100
---------------------------	-----

Hollenden Hotel Co. ....	81
--------------------------	----

Holley Bros. Co. ....	84
-----------------------	----

Horton, F. L., Mfg. Co. ....	98
------------------------------	----

Houk Mfg. Co. ....	65
--------------------	----

Hoyt Electrical Instrument Works ....	97
---------------------------------------	----

Hyatt Roller Bearing Co. ....	84
-------------------------------	----

## D

Dann Oil Cushion Spring Insert Co. ....	57
---	----

Inter-State Motor Co. ....	84
----------------------------	----

Dayton Rubber Mfg. Co. ....	89
-----------------------------	----

Detroit Steel Products Co. ....	85
---------------------------------	----

Detroit & Cleveland Navigation Co. ....	82
---	----

Dodge Bros. ....	59
------------------	----

Dunlop Wire Wheel Corp. ....	4 to 64a to 64d
------------------------------	-----------------

## J

Jeffery, Thomas B., Co. ....	84
------------------------------	----

# Advertisements

## K

K. W. Ignition Co.....	60	Salisbury Wheel & Mfg.
Kamlee Co.....	89	Co. ....
Kellogg Mfg. Co.....	75	Saxon Motor Co.....
Kemco Elec. Mfg. Co.....	87	Schrader's, A., Son, Inc..
Kimball Tire Case Co.....	89	Searchlight Co.....
Kissel Motor Car Co.....	86	Shaler, C. A., Co.....
Klaass & Sachtleben.....	86	Smith Bros.....
Knox Motors Co.....	85	Smith, A. O., Co.....
Kokomo Electric Co.....	86	Sparks-Withington Co.....

## L

Laidlaw Co.....	72	Speedwell Motor Car Co...
Lovell-McConnell Mfg. Co..	47	Spicer Mfg. Co.....
Luverne Auto Mfg. Co....	96	Splitdorf Electrical Co....

## M

McCormick Mfg. Co.....	83	Standard Oil Co.....Cover
McFarlan Motor Co.....	55	Star Ball Retainer Co....
Master Carburetor Corp....	85	Stewart-Warner Speedometer Corp.....
Maxwell Motor Co.....	70	Stromberg Motor Devices Co. ....
Metz Co.....	89	Studebaker .....
Moline Automobile Co....	96	
Morrison-Ricker Mfg. Co...	80	
Muir Co.....	78	

## N

National Motor Vehicle Co. 48		
New Departure Mfg. Co... ....		
..... Back Cover		
New Lite Sales Co.....	84	
New York Coil Co.....	77	
New York & New Jersey		
Lubricant Co.....	87	Vulcan Mfg. Co..... 89
Nordyke & Marmon Co....	86	

## P

Packard Electric Co.....	68	
Paige-Detroit Motor Car Co. ....	88	Wadham's Oil Co..... 81
Parish & Bingham Co....	97	Wahl Motor Co..... 85
Pennsylvania Rubber Co... .	89	Waltham Watch Co..... 52
Perkins-Campbell Co.....	71	Ward Leonard Electric Co. 88
Premier Motor Mfg. Co... 50-51	87	Warner Gear Co..... 80
Prest-O-Lite Co.....	87	Wayne Oil Tank and Pump Co. ....
Pullman Motor Car Co....	78	76

## R

Rajah Auto Supply Co.....	87	Weaver Mfg. Co..... 76
Rayfield Carburetor.....	63	Western Electric Co..... 83
Republic Rubber Co.....	88	Weston Electrical Instrument Co..... 83
Royal Equipment Co.....	74	Wheeler & Schebler..... 46
Rutenber Motor Co.....	89	Willard Storage Battery Co. ....

## S

## T

## V

## W

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## The ALLEN TIRE CASE

should always be specified when you purchase a tire case. It is a positive protection for the spare shoe.



The name "Allen" is your guarantee of superior workmanship and highest quality material.



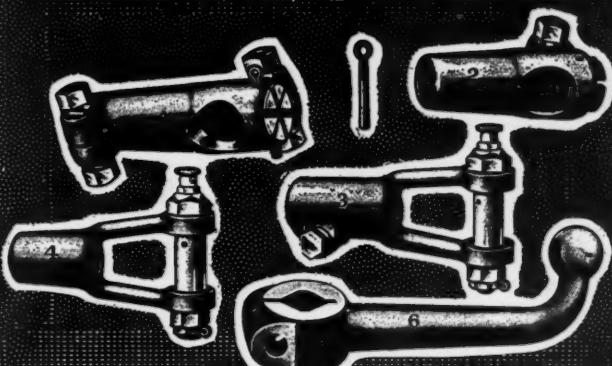
Made in all sizes and for all style demountable rims and wire wheels. Colors to suit. Prices \$3.00 and up. At your dealers, or write the manufacturer direct.



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by  
THE ALLEN  
AUTO  
SPECIALTY  
CO.

1926 Broadway  
New York  
1627 Michigan  
Ave  
Chicago

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Automobile Steering Connectors Are Highly Important Parts And Should Be Obtained From Highly Reliable Manufacturers.

BILLINGS & SPENCER have for several seasons made a complete line of these parts and made them of material carefully selected for the purpose. They are correct in construction, and machined and inspected with great care. Besides, by our large production of this kind of parts, makes it possible for us to care for your requirements with the greatest facility and business advantage.

THE BILLINGS & SPENCER CO. Hartford, Conn.

HB

Hess-Bright

D.W.F.

Our Tremendous Stock of Hess-Bright (HB-DWF) Ball Bearings makes it possible for us to supply the demand for High Grade Ball Bearings regardless of the European War

TO THOSE MOTOR CAR MANUFACTURERS WHO USE HESS-BRIGHT BALL BEARINGS EXCLUSIVELY: By reason of having entered into a contract with us to use HESS-BRIGHT BALL BEARINGS exclusively you are occupying today the enviable position of knowing that every possible preparation has been made to take care of your requirements. Your decision to use the world's premier ball bearing is amply justified, not only from the standpoint of QUALITY, but from the standpoint of SERVICE.

A representative of one of the largest automobile manufacturing companies in this country says:

"I am astounded at your preparation and your ability to meet our needs and the needs of others at a time like this."

On August Third our records show that we had in stock, ready for immediate delivery, one-half million (HB-DWF) Ball Bearings

TO THOSE MOTOR CAR MANUFACTURERS WHO HAVE NOT BEEN USING HESS-BRIGHT BALL BEARINGS: While we, of course, are in duty bound to take care of our regular customers first, it is with pleasure that we extend to you the opportunity to take advantage of our large stock. We suggest, however, that it is much to your interest to send us your specifications immediately, so that we may make arrangements to take care of your needs.

THE HESS-BRIGHT MANUFACTURING COMPANY  
Front Street and Erie Avenue  
Philadelphia, Pa.



**5,918,098 gallons Polarine sold last year  
1,536,232 gallons more than in 1912**

The constantly increasing use of POLARINE by thousands of motorists is indisputable evidence of its lubricating efficiency.

It affords perfect lubrication to all makes and types of motor cars, motor trucks, motorcycles and motor boats.

*POLARINE maintains the correct lubricating body at any motor speed or temperature and remains liquid at zero.*

These essential characteristics obviate the necessity of changing oil for summer and winter lubrication, also the necessity of mixing kerosene, graphite and other injurious products with unsuitable and poor cold-test oil for the purpose of making it feed in winter weather.

**STANDARD OIL COMPANY (AN INDIANA CORPORATION)**  
Makers of Lubricating Oils for Leading Engineering and Industrial Works of the World  
(230)



**Polarine**  
FRICTION REDUCING MOTOR OIL



# NEW DEPARTURE BALL BEARINGS

*American  
Made for  
American  
Trade*

*American  
Made for  
American  
Trade*



*Quality  
Guaranteed*

*Quality  
Guaranteed*

We are the Largest Manufacturers of Ball Bearings  
in the World and Can Deliver Your Orders Promptly

The New Departure Manufacturing Company  
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